BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 25.] 1928. [No. 3.

HISTORICAL.

PISSURLENCAR (Panduronga). Contribuition [*sic*] à l'étude de l'histoire de la médecine portugaise dans l'Inde.—I. Sur quelques médecins portugais dans les cours indiennes. [**Contributions to the History of Portuguese Medicine in India. I. Some Portuguese Doctors at the Indian Courts.**]—*Arq. Escola Méd.-Cirurg. Nova Goa.* 1927. Ser. A. No. 1. pp. 61–68. [21 refs.]

It would be diverting to speculate on what the state of the tropics might now be if the bold and famous seafarers and soldiers and settlers of the past had been unsupported by the quiet co-operation of their physicians: for much of the history of tropical colonization has undoubtedly been made—directly or indirectly—by medical men, though the parts which they have played are not always obvious, or even discoverable, without profound research. It is with a very small section of this vast and intriguing subject—the influence of early Portuguese physicians on the history of India—that the present paper deals. The author has been able to consult a number of documents—written in the Portuguese and Marathi languages—which have hitherto been inaccessible to European historians; and as he has thus drawn upon sources not previously tapped, he has found something new to say. To abstract a paper which is itself the briefest summary—largely made by stringing together pertinent quotations and illustrations—is not easy; but the following points of special interest may be noted.

Several Portuguese physicians appear to have assisted in establishing friendly relations between the original colonists of Goa and the neighbouring Mahratta states. We read, for example, that Garcia DA ORTA, author of the famous *Colloquies on Drugs and Simples* (1563) which is known to botanists as containing the first accounts of many Oriental plants [and is said to be the first book printed in Asia], had made himself *persona grata* at the court of Ahmadnagar. "With NIZAM Shah and his family ORTA lived on a footing of the greatest familiarity. He taught Portuguese to the heir presumptive to the throne, and cured him of the itch."

Another physician of the same patronymic, Fernão LOPES DA ORTA, was sent on demand by ALBUQUERQUE to the court of IBRAHIM ADIL Shah at Bijapur—to tend him in his sickness. But LOPES appears to have been more efficient in the intelligence than in the medical service: for his patient the Shah died (1627), and LOPES, suspected of espionage,

was deprived of his nose, one ear, his coloured Christian wife, and his son, and was cast into prison. He managed to get back later, however, —safe, if not sound—into Portuguese territory.

Apparently the early Portuguese doctors enjoyed a considerable reputation among the surrounding native states, and were frequently called upon to minister to the local rajahs. For instance, in 1699 Prince BEARBAGATH sent to the Viceroy of Portuguese India for a physician to cure one of his generals who was ill; while the rulers of Poona, Colapur, and other Mahratta states, made similar requests on like occasions. It would appear, however, that the doctors were not always dispatched as requested; for once at least, when (in 1747) the famous peshwa of Poona, BALLAJI RAO ("NANA"), demanded a medical expert for one of his nobles who had been poisoned by an enemy, the Portuguese governor cautiously sent him some physic instead of a physician. However, BALLAJI RAO'S son, MAHDAVA RAO, was long under the care of a Portuguese doctor (whose name has not been recorded); and it is believed that it was largely through his good offices that Goa escaped invasion during a native war in 1771.

These and other particulars are succinctly detailed in the present paper, which deals—as already indicated—with medical contributions to tropical history rather than with the history of tropical medicine.

Clifford Dobell.

WINTER (Francis A.). **The Romantic Side of the Conquest of Yellow Fever.**—*Milit. Surgeon.* 1927. Oct. Vol. 61. No. 4. pp. 438–452.

Colonel Winter has written his essay around REED and his associates. It is difficult to judge whether it is intended to be read as a romantic narrative of the life and work of that gallant band or as a chapter of medical history. Considered as the former it reads coldly, is too full of dates and scientific details; and it is hard to forgive the editor for appending to a paper with such a title five paragraphs of argument about a date.

Colonel Winter says "the romantic in this story shines out like that in the account of Napoleon at Marengo, or of d'Artagnan on the road to Calais." There is about his story, as there was about Napoleon, a heaviness, a something sombre, but nowhere does the reader catch the spirit of d'Artagnan. Take the account of these men bravely inoculating themselves with a loathsome disease. After deliberation on the possible attitude of the Press to human experiments, "the members of the Commission, however, decided to emphasize their personal interest by submitting themselves to the tests." Romance is killed at a blow; one can almost see the Commission in solemn conclave, with resolution duly moved and seconded. Winter reminds us that de Kruif has told this story in popular style; he has indeed and, though the language may be over florid for the taste of some, there lives again in his glowing words something of the ardent spirit that held CARROLL to the work when deprived of his leader, that fortified LAZEAR in the sacrifice of his life and that brought back REED to the post of danger so soon as freed from duty in a safer sphere.

There are many indications throughout the essay that the chief appeal to the author, in the work he records, is the high sense of duty manifested, the grave acceptance of risks well understood and the

serious purpose which actuated the men of whom he writes. That REED himself was rather a Napoleon than a d'Artagnan is the impression given by quoted passages in letters to his wife and by the solemnity with which, when two volunteers for inoculation scorned the proffered monetary reward, he is said to have risen, raised hand to forehead and said with fervour "Gentlemen, I salute you." An interesting contrast offers in the personality of Adrian STOKES, the most recent victim of yellow fever research. His letters describing his work breathe the very spirit of Dumas' Gascon hero.

Regarded as medical history (and Colonel Winter has himself and his editor to thank if his essay is so regarded) the sketch is even less satisfying. It is neither complete nor accurate. The conquest of yellow fever did not begin with FINLAY, nor has it ended yet; the elucidation of its method of spread was not a matter of a few months' intensive work in Cuba. True, the final stages of investigation were brilliantly conceived and rapidly carried through; but what of the directions for the line of advance worked out by pioneers attacking the same disease or another? What of NOTT (1848) and his definite suggestion that mosquitoes were concerned in the spread of it; BEAUPERTHUY (1850–60) holding to his view that the "househaunting mosquito" was the vector; MANSON and ROSS and their 'true bill' of disease-bearing proved against mosquitoes? Did these not point the way? Neither the history nor the romance of the fight against yellow fever can rightly pass over the names of these and others.

One of the most dramatic of the undertakings of REED's men was their demonstration that yellow fever cannot be spread by fomites. No doubt many at that date believed that the disease could be contracted from the linen or person of the infected. Winter, however, says "the validity of this view *was first questioned* [italics by reviewer] when Reed and Agramonte investigated an outbreak of the disease at Pinar del Rio on July 31st, 1900." This cannot be maintained. So early as 1883 HIRSCH writes, "the question concerning the contagious character of yellow fever is decisively answered in the negative"; he quotes LAWSON as saying "there was no evidence to show that persons labouring under the yellow fever, or the bodies of those who had died of it, gave off a poison capable of exciting the disease," adding that "this passage may be taken to express the most recent conviction arrived at by the whole of the medical world acquainted with the circumstances in question."

Without wishing in any way to diminish the courage and fortitude of those of the Cuba researchers who slept for 20 nights in the foul linen of yellow fever patients, it is right to point out that the test had been made before. It is worth while to reprint part of a passage from HIRSCH, written 17 years before the Cuba experiment and quoted in full in this *Bulletin*, Vol. 20, p. 18.

> "Even the most intimate kinds of contact, such as the healthy and the sick sleeping in one bed . . . the use of the uncleansed linen, clothes, or beds of yellow fever patients . . . and the like, have in no wise contributed to the spread of the disease. Particular emphasis has been laid in some quarters upon the fact that specially designed experiments to induce infection . . . by the wearing of the linen and clothes used by the sick and saturated with their perspiration, have always yielded a negative result."

There can be no denial of the efficacy of the preventive methods evolved in Cuba, but it is difficult to maintain that the limitation of

yellow fever to its present narrow sphere of action has come about *solely* through the discovery of the insect vector. British Guiana, once a focus of the disease, has been free from it since a date *prior* to the Havana discoveries, but no reduction of Aedes was attempted until very recent times. Why did the disease disappear? Why did it not disappear from Cuba?

The conquest of yellow fever can never be complete until the causal organism has been identified with certainty. It may be said, indeed, that the uncertainties surrounding yellow fever have recently increased. One certainty remains ; the sacrifice of the lives of LAZEAR and STOKES will never hold back others, but rather attract to this problem both those who see in medical research a noble opportunity of benefitting their kind and those who find in it the risk and glamour of high adventure.

J. F. C. H.

OUY-VERNAZOBRES (Ch.). Le paludisme de Napoleon Ier. [**The Malaria of the First Napoleon.**]—*Aesculape.* 1927. Apr. Vol. 17. n.s. No. 4. pp. 98–107. With 11 figs.

An interesting article, well furnished with portraits and cartoons of Napoleon, but with very slight reference to malaria. It seems that Napoleon was attacked with what was probably benign tertian in Corsica when he was seventeen (1786), that the following year he obtained leave of absence from his regiment from May to December, but was recovered in September and returned to France. In 1788 he joined his regiment at Auxonne on the river Saône and here he had a continuous fever which is described as afflicting him for four days, leaving him for four days and then returning. This is considered by the author to be a second malarial attack ; convalescence was slow. Later his health was good and there was no return of fever. At the autopsy in St. Helena in 1821 nothing suggestive of malaria is recorded. The cause of death was, as is well known, cancer of the stomach.

Other matters of interest to us in this article are two illustrations, one of which reproduces a picture by Gros " Bonaparte visite les pestiférés de Jaffa " and the other " Poisoning the Sick at Jaffa," a caricature by Cruickshank. LARREY, among others, records that, to encourage the scared soldiers to save these sick men from massacre by Arabs the Emperor spoke to them and even pressed a bubo so that pus spirted out. This is the scene which Gros depicted.

A. G. B.

SHELTON (C. F.). **Tropical Abscess of the Liver.**—*Kenya Med. Jl.* 1927. Feb. Vol. 3. No. 11. pp. 315–322.

Treatment. (1) Pre-anaesthetic and pre-antiseptic period—only pointing abscesses opened and drained. Mortality close on 100 per cent.

(2) Anaesthetics and antiseptics—open operation and drainage—mortality 60–80 per cent.

(3) MANSON 1883—trocar and cannula method—a very great advance. MANSON wrote (1883)—" Not many years ago, to tell a patient he had

an abscess of the liver was nearly tantamount to telling him that he was about to die. Since the introduction of the aspirator, the drainage tube, and of Listerism, the prospects in this disease have enormously improved ; at any rate we need no longer stand by the patient with folded arms."

(4) The necessity for administering ipecacuanha before and-or after operation began to be recognized [circ. 1909].

MACLEAN in 1871 empirically advocated ipecacuanha together with evacuation by needle and syringe. Apparently he did not realize the most important part played by ipecac.—nor did he do sufficient work to put his treatment on a really sound basis—as did ROGERS years later, to whom belongs the credit of (5) introducing the hypodermic administration of emetine, and of convincing all of the prime necessity of giving this drug in all cases of liver abscess. This, and his work on the pre-suppurative stage of amoebic hepatitis, brought about a marked decrease in incidence and mortality of liver abscess.

(6) The last decade—when in most cases simple aspiration plus administration of emetine has become the method of choice. [Developing into the withholding of aspiration except for the larger collections of pus, and relying more and more on emetine alone.]

The author quotes illustrative cases of 100 years ago—they died of ruptured liver abscess before mercurial poisoning (calomel given until the system was " well under its influence ") could kill them. Attention is drawn to the fact that liver abscess may be present in the absence of all the classical signs and symptoms and a case, in illustration, is described. Probably there is always some risk of even fatal haemorrhage from liver puncture. ROGERS considers such accidents more frequent than is supposed ; " few surgeons have the courage to report their cases." Most of such fatal accidents occur where no pus was found on exploration—autopsy too showing absence of suppuration in liver. Probably they are cases of pre-suppurative hepatitis with intense engorgement of liver. Therefore a course of emetine should always be given before proceeding to needle suspected cases. After aspiration of pus (all of it at one sitting) a further course of emetine must be given.

H. M. Hanschell.

HERMANS (E. H.). Enkele beschouwingen over de geschiedenis van de framboesia tropica. [**Some Reflections on the History of Yaws.**] —*Nederl. Tijdschr. v. Geneesk.* 1927. Mar. 5. 71st Year. 1st Half. No. 10. pp. 1191–1198.

In this paper, which is a lecture delivered before a scientific society, the author briefly sketches the history of our knowledge of yaws—beginning at the 17th century, and devoting special attention to Dutch contributions to the subject. It is an interesting paper, and contains numerous allusions to the early literature ; but as the author presents his own conclusions and interpretations without the support of proper references, it is not always easy to judge how far his conceptions are well founded. He states at the beginning, however, that the present paper is merely a partial account of a fuller historical survey which he is about to publish in a monograph dealing with Framboesia generally. This extended version will be awaited with interest.

Clifford Dobell.

VAN DER WEYDE (A. J.) Bijdrage tot de geschiedenis der pest te Utrecht. [**On the History of the Plague at Utrecht.**]—*Nederl. Tijdschr. v. Geneesk.* 1927. June 4. 71st Year. 1st Half. No. 23. pp. 3119–3139. With 4 text figs. [Refs. in footnotes.]

It is a striking indication of the interest taken in the history of medicine in Holland that the first issue in the month of the *Nederlandsch Tijdschrift voor Geneeskunde,* the organ of the Dutch Medical Association, always contains several original historical articles. In the present paper the author gives an interesting history of the epidemics of plague in Utrecht from 1439, when the first epidemic occurred, until 1666, the date of the last epidemic.

It is noteworthy as illustrating the association of rats with plague that in 1448 and 1450 attention was drawn by the authorities to the prevalence of these vermin and an order was issued forbidding the destruction of weasels, stoats and polecats and their sale to furriers. During the 15th century little use was made of the existing hospitals for admitting cases of plague, and it was not until the beginning of the 16th century that regulations were drawn for the admission of such cases to hospital, special care being taken by the town council to select those hospitals for the purpose which were in isolated situations. None of those selected are still in existence, but the author's paper contains reproductions of some contemporary engravings of these hospitals, the most famous of which was the Leeuwenborch hospital, where the late Professor MAGNUS's pharmacological institute is at present situated.

During the sixteenth century Utrecht was visited by epidemics of plague in 1507, 1514–1518, 1557–1558, 1574–1575 and 1586, the mortality being highest in 1514.

In the seventeenth century epidemics took place in 1616, 1624–1632, 1634, 1655 and 1664–1666. No subsequent outbreaks occurred, in spite of the prevalence of the disease in Germany.

The author gives a series of tables showing the total mortality and number of deaths from plague in the four quarters of the years 1634–1637, 1655 and 1656 and the annual figures from 1657–1663, as well as a table showing the situation in the town of the fatal cases, from which it appears that plague in Utrecht, as everywhere else, is a disease of the poorer classes.

In conclusion the author emphasizes the fact that our forefathers, in spite of the limitations to their knowledge, did their best to keep epidemics of plague in check.

J. D. Rolleston.

PIÉCHAUD (F.). La peste à Bordeaux et la naissance de l'hygiène urbaine. [**Plague and the Birth of Hygiene in Bordeaux.**]—*Jl. Méd. de Bordeaux.* 1927. June 10. Vol. 104. No. 11. pp. 447–449.

M. Piéchaud writes of Bordeaux as it was in 1585 and onward to 1672, taking his information from the *Chronique Bordelaise.* In 1585 there was an extremely severe epidemic of plague; from June to December 14,000 people died in the city. Bordeaux was a large, rich and famous city, full of grand and beautiful churches and other buildings; but without proper drainage and having only narrow and filthy streets. In these respects it was no worse than other large cities of the time. The domestic affairs of the city were managed by aldermen. The Mayor,

though chief citizen, was purely decorative, dealing only with outside politics. In 1585 the Parliament fled and many of the citizens followed them. Bordeaux is described as deserted, with only a few aldermen to carry on the administration of the town. When plague was first noticed a man of good position was appointed Captain of the Plague. Early in 1586 the plague hospital was removed outside the walls of the city and good buildings were erected with public money. The resident staff consisted of: an almoner who took care of the clothes and goods of the patients, a barber, a surgeon, a priest, a purveyor and two chambermaids who washed the linen and made the beds. The almoner was controlled by the priest, and at the close of an epidemic these two had to swear before Saint Antoine and Saint Fort that they had conducted their work with honesty! The staff was fed at the expense of the patients. If a patient recovered notice was given to the Captain of the Plague who, with the consent of the aldermen, ordered his discharge after a certain time had been spent in a convalescent hospital.

Any attempt at evasion was punished with whipping. Inside the city the rules were stuck up outside the town hall and criers proclaimed them at the crossways. Did a case occur in any house the owner must inform the ward alderman, who informed the Captain of the Plague. The latter sent a surgeon to examine the case and waited one hundred paces from the house. If the master of the house wished to remain in the house with the patient and family the city locksmith was sent for, and a special lock was placed on the door. No person could leave that house until permission was given. The key was given to a neighbour who was ordered to pass in food at intervals. When the danger was passed the house was opened, cleaned and fumigated, beds and linen were washed and then the family were given freedom. If the master of the house decided that the plague patient could not remain in the house the sick person was at once conveyed to the hospital. The house was locked, a wooden cross placed in front of it and the family were confined for 40 days. Surgeons attending plague cases had to carry a short white rod and the priests also carried a similar rod as an ensign of plague duty. Public games and dances were forbidden during an epidemic. The streets were kept clean and people were forbidden to throw filth and rubbish in front of the houses as was the custom in those days.

J. H. Tull Walsh.

DINĀNAH (Taha). Die Schrift von Abi Ga'far Ahmed ibn 'Ali ibn Mohammed ibn Ali ibn Hatimah aus Almeriah ueber die Pest. [**The Writings of Abi Ga'far Ahmed on the Plague.**]—*Arch. f. Geschichte der Med.* 1927. Vol. 19. No. 1. pp. 27–81. [Refs. in footnotes.]

Abi Ga'far Ahmed wrote of plague in Almeriah in the year 749 A.H. (A.D. 1348). He gives a definition of "Ta'un" (plague) which, like the famous Ibn Batûtâ, he seems to have studied carefully. Plague is a universal illness from which mankind suffers, generally fatal and due to a common cause. He then discusses this definition in some detail and describes symptoms, thirst, cough, fever and swellings. He says that the direct (near) cause is corruption of the air, which may be partial or total, and makes distinction between the two. The indirect causes (further) require knowledge of astronomy, but are not governed

by climatic conditions, rain, wind, etc. The disease was supposed to have spread from China. Food and drink are considered and as a preventive he recommends

Aloe 2 parts.
Myrtle and saffron each 1 part.

Treatment is that of symptoms with bleeding and syrup of vinegar and syrup of roses, etc. For the buboes also bleeding is useful when there is fever. For outward applications the author recommends for sores oil of roses thickened with mastic and thick quince juice with the following drink :—

Quince juice boiled thick and syrup of roses, of each 1 oz.
Plantain seeds, Armenischer Ton (clay), of each 2 drms.

Many applications containing fat, wax, oil of violets, etc. were to be put on the bubo before suppuration. When the bubo was ripe and contained pus it should be opened.

J. H. Tull Walsh.

D'IRSAY (Stephen). **Defense Reactions during the Black Death, 1348-1349.**—*Ann. Med. History.* 1927. June. Vol. 9. No. 2. pp. 169–179. [78 refs.]

So much has been written about the Black Death during the later years of the fourteenth century that a compiler cannot discover much new material. Many books and documents have been consulted and facts have been taken from the " Black Death " by Johann NOHL, reviewed in this issue of the *Bulletin.* But the study of such history is not only of general interest, it is of value for estimating the mental attitude of those who lived and of those who fought the plague in past times, against great difficulties, having none of the advantages of the scientific knowledge which we now possess. Thus we can understand the progress made since those early days. A few extracts will show that most of the defence work was of a general sanitary nature ; of medical defence little can be said. The depth of graves was one of the main concerns of the authorities, clearly recognizing thereby the contagion inherent in the diseased body as such, even in death. In Avignon much attention was paid to quick and appropriate burial. Pope Clement VI. did things of great charity, and to hasten the burials and prevent infection gave money to anyone who would carry the corpses, for there were hardly enough left to bury the dead. The air of the towns was cleansed by great fires. Simon de Couvain saw that shutting the people up in their houses was no remedy : " To hide is of no avail, flight only protects, but flight where ? " All kinds of things and all kinds of people were accused as the cause of plague. The Jews were especially selected for suspicion and persecution. Pope Clement protected the Avignon Jews and so did the Archduke of Austria, giving them refuge in his fortress, Kyburg. Even then the mob broke through the gates and lynched some of the refugees. In the same years (1348–49), King Casimir of Poland gave asylum to Jews, which is the reason for the dense Jewish population of Poland to-day.

J. H. Tull Walsh.

SEVERN (A. G. Millott). **A Note Concerning the Discovery of the** *Bacillus pestis.*—*Jl. Trop. Med. & Hyg.* 1927. Aug. 15. Vol. 30. No. 16. pp. 208–209. [2 refs.]

This is a controversial article in which the author disputes YERSIN's claim to priority as discoverer of *B. pestis*—see this *Bulletin,* Vol. 24,

p. 341 (LAGRANGE). KITASATO and YERSIN, both working at the same time, discovered the bacillus of plague independently; the former sent a communication to the *Lancet*, 1894, ii, p. 428, while the latter published his discovery in the *Ann. Inst. Pasteur*, 1894, viii, p. 662. In spite of the fact "that Kitasato's first description of the plague organism contained some inaccuracies, doubtless owing to hasty observation and his desire for early publication," Dr. Severn thinks that priority should be given to KITASATO.

J. H. Tull Walsh.

DENNEY (O. E.). **Inaugural Medical Debate on Elephantiasis or Lepra Arabum. By Benjamin NIESIUS. Translated from the Original Latin and Greek by Chaplain Benedict STETTER.**—*Ann. Med. History* 1927. Sept. Vol. 9. No. 3. pp. 267–276. [U.S. Marine Hosp. No. 66 (National Leprosarium) Carville, La.]

With the exception of the present remarkable thesis for the degree of Doctor of Medicine in the University of Strasbourg in 1673, nothing is known of the author Benjamin Niesius, who, as the title page states, hailed from Frankfort-on-Main.

The thesis opens with a discussion of the etymology of elephantiasis followed by its definition "as a very poisonous, contagious Universal disease arising from atrabilious humour surrounded by many symptoms." The question of heredity is then dealt with, and PLATERIUS is quoted to the effect that "sometimes the children remain immune throughout life, but the plague shows itself in the grandchildren for the first time."

The contagious character of the disease is illustrated by its being transmitted from husband to wife and from the suckling mother to her infant, or through mediate contact when miasms are present in the clothes. Niesius recognized that leprosy was a disease of adolescence and affected males more frequently than females. It is noteworthy that his description of the signs of early leprosy include discolouration of the skin, difficulty in breathing, and numbness and coldness of the feet, while falling out of the hair, the appearance of tubercles beneath the skin of the forehead and cheeks, venous stasis in the face, flattening of the nose, the appearance of pustules, conjunctivitis, cracking of the hands and feet, and extensive ulceration are mentioned as manifestations of the advanced stage. Niesius regarded the prognosis as hopeless, and it is obvious from his review of the surgical, dietetic and pharmaceutical "remedies," the last including the famous potable gold extolled by PARACELSUS, that he expected little benefit to be derived from treatment.

J. D. Rolleston.

VAN SCHEVENSTEEN (A. F. C.). Une consultation de la faculté de médecine de Louvain au sujet de la lèpre à Anvers au début du XVIIIe siècle. [**A Consultation of the Louvain Faculty of Medicine on Leprosy at Antwerp at the Commencement of the 18th Century.**] —*Janus*. 1927. July–Aug. Vol. 31. No. 7-8. pp. 286–293. [Refs. in footnotes.]

The present communication contains a French translation of a Flemish document drawn up by the Mother Superior of the Terniezen Leper Hospital at Antwerp and addressed to the Medical Faculty of Louvain, together with their reply in Latin.

The circumstances under which this document was drawn up were as follows. Admissions to the hospital were made under the supervision of six of the oldest medical practitioners of the town, three of whom were physicians and three surgeons. According to the Mother Superior the diagnosis of each case was made so hastily that a large number of ordinary skin complaints which had nothing to do with leprosy were admitted to hospital. The doctors, the reverend mother continues, had maintained that there were three stages of leprosy, and that the apparently harmless affections from which the patients were suffering were really the first stage of the disease. In that case it would appear that half mankind was affected with leprosy. The Faculty was therefore respectfully requested to answer the three following questions:

1. Were there really three stages of leprosy?

2. If the hospital, which had been founded for the benefit of lepers, was obliged to keep the patients in all the three stages of the disease, if such stages really did exist?

3. If cases of scabies, eczema, pustules and similar affections should be regarded as leprosy?

4. If it would not be advisable to carry out some preliminary treatment, such as bleeding, so as to determine who really were lepers, or before coming to a final decision to let a certain time elapse during which a test treatment might be applied ?

The answers of the Faculty ran as follow :

(1) There are only two kinds of lepra, the *lepra Graecorum*, a form of impetigo, and *lepra Arabum*, or true leprosy. Three stages in true leprosy could be distinguished, viz., the beginning, the advance and the height of the disease, but none of these stages included scabies, much less eczema or similar affections.

(2) The hospital was not founded to keep cases of scabies, ringworm and such like conditions.

(3) Cases of scabies, ringworm, and syphilis could not be regarded as leprosy.

(4) In obvious cases there was no need for special caution, but a special place should be kept for doubtful cases.

The replies did not give entire satisfaction, as was shown by a further enquiry as to the true signs of leprosy addressed to the Faculty, who replied in a somewhat ambiguous strain, with references to the works of FERNEL and SENNERT.

The result was that neither party was satisfied and the apparently acrimonious discussions between the Mother Superior and the consultants of the hospital persisted.

J. D. Rolleston.

MACARTHUR. **Old-Time Typhus in Britain.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Apr. 27. Vol. 20. No. 8. pp. 487–503. With 2 figs. on plates. Also in *Jl. Roy. Army Med. Corps.* 1927. June. Vol. 48. No. 6. pp. 401–418. With 2 text figs.

This interesting lecture is enriched with all the curious lore and varied scholarship to which the author has now accustomed us. For prologue it has a short account of the nature of the louse—that beast whose behaviour in the less fastidious days of *The Merry Wives of Windsor* suggested the agreeable familiarities of love, but whose

scandalous attempts at intimacy are decisively repulsed by the more serious wives of to-day. Here we learn that however different their tastes, our forefathers were not quite so ignorant as some of us are inclined to think, since we are told that their methods of keeping lice in check could not, in principle. be improved on at this moment.

In his approaches to the subject of typhus the author is perhaps more conjectural than is usual with him ; it is not until he reaches the year 1414 that we can yield ourselves to his authority and charm. He argues that the word "ague," as it occurs in ancient records and in early literature, had no connexion with chills and rigors, but meant no more than σύνοχος [literally "joined together," and applied by GALEN to unremittent fevers], and so means any sort of fever, inclusive of the typhus often concurrent with or sequent to famine ; and he suggests that this interpretation is supported by Shakespeare in Macbeth's defiance of the besieging hosts of Malcolm and Siward—"There let them lie, till famine and the ague [i.e., famine fever or typhus] eat them up." Chaucer does indeed contrast an "agu" with a "fever terciane" ; but the ague mentioned by the Venerable Bede in his *Ecclesiastical History* was a long continued sickness with recurring fits, the onsets of which were accurately anticipated ; and most of Shakespeare's references are either to ague fits (e.g. those of Caliban) and ague shakings (both literally, and also metaphorically of persons in the desperate quotidian of love), or to ague contracted by individuals exposed, insufficiently clad, to foul weather. The author, however, is assured that Macbeth's pious wish was for typhus as a necessary consequence of famine, because in historic times it is definitely known that the two things famine and typhus were constantly associated. This may perhaps be a good enough argument for this one particular quotation ; but as to whether it will support the further inference that the pestilences that accompanied all the great famines of Norman and Plantagenet times were typhus fever, one cannot share the author's confidence, since the earliest of these pestilences mentioned by him—that recorded in the *Anglo-Saxon Chronicle* of 1087 is called in Ingram's translation of the *Chronicle*, "diarrhoea," and we know that diarrhoea and dysentery were the chief secondary causes of sickness and mortality in the big Indian famine of 1876–77.

We follow the author with unhesitating interest when he comes to John Stow (*c.* 1525–1605) and John Howard (1726–1790). Here we get a stirring account of gaol fever, and of the horrors of the gaols, and the iniquities of the gaolers, in the loathsome dens where their typhus-stricken prisoners—even prisoners awaiting trial—were left to rot. "Sometimes untried prisoners, after years of hope deferred, in the end would be carried into court and propped up in the dock, dying on their feet of gaol fever." The miserable victims might linger and rot in oblivion, but at times, when they were dragged out for trial, a sudden awful judgment would fall upon the myrmidons of the law—upon the very judges themselves in their majesty and its reverberations would spread far from the court of law among a population generally more or less verminous. One such blow—the Black Assize of 1577—fell upon Oxford when gaol fever broke forth among those who had been in court, and the death-roll included two judges, the sheriff and under-sheriff, six justices of the peace, almost all the members of the grand jury, a hundred members of the University ("not a College or a Hall escaping"), and many others, up to a sum total of 510. The author hath made an excellent description of it — an excellent moral on lice

in royal courts, too, as well as in courts of law. Another notorious Black Assize was that of the Old Bailey, in 1750, when, as if to add to the appalling significance of the portent, the Lord Mayor in the middle of the Bench and only those who sat on the left hand of him died of the fever—three judges, all but four of a jury, and more than forty barristers and underlings. This startling calamity was ascribed to lack of ventilation, it having been decided by the great Lord Bacon, nearly two hundred years before, that the fever was caused by some sort of insinuating inodorous smell [we thank the author for this and other japes at that overworked reputation]; consequently a wonderful sort of windmill was devised by the experts and, after a considerable interval was erected on the roof of Newgate, for removing the foul air from the cells. In the course of its erection, 7 out of the 11 workmen took gaol-fever. Notwithstanding that the contraption was pronounced by the experts to be very good, gaol fever was reported as prevalent all over the gaol seven years afterwards. Here again the author, like a modern Herodotus, delights the reader with all sorts of amusing and edifying digressions, including an excursion into the Gordon riots, which he introduces, not to teach us how a King forsaken by pusillanimous Ministers defied and dispersed a licentious mob on his own initiative, but to remind us that the leader of the sedition ended his lawless days in Newgate gaol and died there of gaol fever.

After dealing with typhus as gaol fever we go on to ship fever—to typhus said by LIND, in 1757, to be "the most fatal and most general cause of sickness in the Royal Navy"; and then to illustrations of typhus in armies, or camp fever.

The gradually changing class incidence of typhus is next touched upon. The disease, in Stuart times impartial as death itself, gradually forsakes the gilded chambers of the great as the eighteenth century advances, and finally settles among the narrow cribs of the proletarians —earliest in England, later in Scotland, last in Ireland. The course of these events is well illustrated from letters, Pepys's diary, and the recent history of Ireland. But the author does well to remind us that even in England there were 160 deaths from typhus in 1889, and that even in England the annual returns for the last ten years show a blank column for this disease only once—so that it is not to be regarded as extinct.

Another tribute is now paid to our forefathers, whose clinical descriptions of the disease, two centuries old, are said by the author to be better in some respects than those sometimes found in modern text-books. The old observers' knowledge of the manner of its dissemination too was accurate so far as it went, and was often efficacious in checking it. "Even the possible rôle of lice . . . was considered." LIND's recommendation for eradicating gaol fever could hardly in the author's opinion be bettered to-day, and ship fever would not have lasted so long after his time if his recommendation, that all drafts for the Navy should go to special depot-ships and there be thoroughly cleansed and given fresh kit, had been adopted.

Finally, the lecturer, like another Timotheus, after moving his audience to laughter for the louse among the poets and the wits and the Tudor fine ladies and Stuart courtiers, ends in heroic mournful strains, with BACOT and CRAGG, and the good and brave doctors who have perished in their hundreds in the long, self-sacrificing combat with this noisome and fell disease.

A. Alcock.

CALLENDER (G. R.). **Dysentery.**—*Arch. Path. & Lab. Med.* 1927. Vol. 3. No. 4. pp. 665–692. With 5 figs. [Historical Reference List & full bibliography.]

A general review. Only an indication of its learned scope and great interest can be given here. Diseases of the intestine are mentioned in the oldest medical document yet discovered—the Brugsch and Eber papyrus. Of religious books, the Babylonian Talmud deals with dysentery. In the Bible there are occasional suggestions of dysentery, e.g., King Jehoram for his waywardness was inflicted with disease of the bowels—they "fell out." [Possibly this was carcinoma.] HIPPOCRATES used the terms diarrhoea and dysentery, differentiated between them, and noted that one led to the other and both increase in prevalence during the same periods. Lientery (stools containing undigested food) was separated from the first two conditions. He recognized the ages and conditions of greater mortality, and that fever and the passing of fleshlike material denoted a greater severity of the disease. The full accounts of the alvine fluxes given by ARETAEUS and GALEN show that considerable knowledge had been gained of the lesions accompanying the different clinical varieties. The next thousand years show that most of this knowledge was lost.

As to treatment—ipecac is first mentioned in Purchas' Pilgrimes in 1625. It was used as a secret remedy by HELVETIUS in 1680, and financially backed by King Louis XIV. The first reference to emetine is by BARDSLEY in "Hospital Facts and Observations," London 1830. WOODHULL, U.S. Army, published in 1876 his studies on ipecac—he did not succeed in getting it used in dysentery to the extent to which he felt it was justified. VEDDER in 1911 demonstrated the amoebicidal properties of emetine, and in the next three years Leonard ROGERS standardized its use in amoebic dysentery. The epidemiology of dysentery, 1669–1672, was discussed at length by SYDENHAM [who first described the arthritis of dysentery]. In 1681, LEEUWENHOEK, with the microscope of his own invention, found in his own stool the organism now known as Giardia [see this *Bulletin*, Vol. 16, p. 89]. The author further mentions the observations and researches of succeeding workers—until 1857 when MALMSTEN discovered *Balantidium coli* in two cases of chronic dysentery. In 1875 LÖSCH discovered the amoeba of dysentery in bowel discharges and in scrapings from ulcers of gut. KARTULIS, 1886–1891, first described amoebae in pus of liver abscess, and by inoculating cats produced dysentery of the type now known to be caused by *E. histolytica*. The term "amoebic dysentery" was introduced by COUNCILMAN and LAFLEUR in 1890–1891. CASSAGRANDI and BARBAGALLO (1897) differentiated fairly well between the harmless and pathogenic amoebae. SCHAUDINN (1903) introduced the terms *Entamoeba coli* and *Entamoeba histolytica*. His accounts were almost wholly erroneous and it has taken many years to correct the conceptions formed as a result of his work. The distinctions were cleared up to a large extent through the work of WALKER and SELLARS (1911), confirmed by that of W. M. JAMES (1914). In 1925 BOECK and DRBOHLAV successfully cultivated *E. histolytica*.

In 1897 SHIGA isolated a bacillus in epidemic dysentery in Japan. In 1900 FLEXNER described another bacillus from the Philippine dysentery. Since then while convinced that Shiga and Flexner groups produce a characteristic dysentery, it is becoming clear that the Salmonella groups also give rise to an entirely similar dysentery.

Transmissible lysis of bacteria (phenomenon of TWORT and D'HERELLE) appears to be particularly applicable to the dysentery group of bacilli, and possibly will in the future influence methods of treatment.

The author goes on to describe and discuss the observations of many workers on the various dysenteries during the Great War, and under the headings protozoa, amoebic, balantidial, flagellate, and bacillary dysentery, describes (and illustrates with excellent plates) each type of disease and its treatment. Once more he emphasizes the practical importance of the cytology of the bowel exudate in diagnosis.

H. M. Hanschell.

BEESON (B. Barker). *Acarus scabiei:* **Study of its History.**—*Arch. Dermat. & Syph.* 1927. Sept. Vol. 16. No. 3. pp. 294–307. With 2 text figs. [29 refs.]

The subject of this paper is the itch-mite, and not the time-old skin-disease for which the creature is responsible. The author disavows any attempts to review all the written records, but in footnotes he gives many useful references to standard works; and among these he notices FÜRSTENBERG'S *Die Krätzmilben der Menschen und Thiere* (Leipzig, 1860) as giving the best account of Acarus that has been at his avail, and LANQUETIN'S *Thèse de la gale,* Paris, 1858, as ranking among the best contributions to the subject.

FÜRSTENBERG thought—and the classical authors HEBRA and NEUMANN are in agreement—that the first notice of a parasite in scabies occurs in the writings of ST. HILDEGARDE (1099–1179), abbess of the convent of Rupertsberg; but HARDY (*Maladies de la peau,* Paris, 1858) believed that "an animal" was mentioned by the famous AVERRHOES and BAZIN (*Leçons . . . sur les affections cutanées parasitaires,* Paris, 1862) and certain other authors give the credit to another Arabian physician, ABU-MEZZOAN ABDELMALIK ben Zohar, also known as AVENZOAR and by several other aliases of somewhat similar sound (1070–1162).

Between the eleventh and the sixteenth centuries there appears to be a blank; but the author quotes FÜRSTENBERG as claiming that in the very last year of the sixteenth century John SCHENCK (*Collection of Medical Observations,* 1600) stated that Germans were familiar with the itch-mite and knew how to extract it). Among other sixteenth century writers here mentioned as knowing a good deal about the itch-mite are to be found the familiar names of SCALIGER, FALLOPIUS, and RONDELET, also Laurentius JOUBERTUS (in 1577) and Vidus VIDIUS (in 1586).

It is noted, however, that some of these ancient and mediaeval worthies may have confused (and sometimes did actually confuse) the itch-mite with the louse, or even the crab-louse; and the same caution may be applied to some of the writers of the following century.

Coming to the seventeenth century, we find the names of several competitors for the honour of having actually described and figured the true itch-mite and realized its pathological significance. LANQUETIN (*De la Gale,* Thèse de Paris, 1858) stated that a Frenchman, BOREL (1620), mentioned the tortoise-shape of Acarus. KAPOSI credited an Englishman, Thomas MOUFFET (1634), with the first exact description of the itch-mite, and FÜRSTENBERG named MOUFFET as the first to discriminate between Acarus and Pediculus. RASPAIL (whose works are cited by the author) stated that in 1687 an Italian,

CESTONI, writing under the pseudonym of BONOMO communicated to the famous REDI his discovery of the itch-mite; CESTONI therefore (or BONOMO and CESTONI, if, as some think, they are names of separate persons) has been regarded by some as the original discoverer (or discoverers) of Acarus as the responsible parasite of scabies. But here again caution is necessary, since, according to HEBRA, a certain Giovanni CALVOLI claimed in 1689 to have made the discoveries revealed by CESTONI. Among other seventeenth century writers mentioned by the author is Carolinus MUSITANUS (1688) as being one of the first to state that the mite is to be found, not in the vesicles but at the end of its burrow.

Among the eighteenth century writers the author mentions Jacob ZCHWIEBE (1722) whom FÜRSTENBERG wrote of as thinking preserved fruits to be the source of the itch-mite; NYSANDER or NYANDER (1757), who understood that the mite must be looked for in a wrinkle proceeding from the pustule, not *in* the pustules; CASAL (1762), in Spain, who mentioned the mite by its Spanish name *arador* (prob. = Latin *arator*, or *plougher* of the skin); E. L. GEOFFROY (1764) who discriminated between the itch-mite and the flour and cheese mites; WICHMANN (*Aetiologie der Krätze*, 1786), who emphasized the fact—not so well understood at the time—that the acarus was the *cause* of the skin disease; the famous Swedish naturalist DE GEER, who gave what FÜRSTENBERG eulogized as the first faithful representation of Acarus in man; KRUNITZ (1791) who fancied that the mite could cause disease only in persons so predisposed.

In the early part of the nineteenth century there were still people who were uncertain about Acarus as a parasite of man and a cause of the disease itch, notwithstanding that the renowned LATREILLE had, in 1806, bestowed the significant generic and specific names *Sarcoptes scabiei* upon the creature; that Joseph ADAMS (1807) had described—instructed thereto by an old lady in Madeira—how the mite could be found, at the end of a fine irregular red line where such a line could be observed issuing from a vesicle; and that WALZ (1809), as well as other veterinarians mentioned by HEBRA, had published instructive observations of the acari that cause itch in sheep and other animals. In 1812 J. C. GALÈS, in Paris, began to investigate the question of scabies, and gave demonstrations of mites found in the vesicles and pustules of that disease, which he believed to be itch-mites. LAMARCK made some rather feeble criticism of GALÈS, and in 1828 MEYNIER, an assistant to RASPAIL, showed that the mites demonstrated by GALÈS were grain mites [which accounts for their having been found in the vesicles]. However, in 1834 one of RASPAIL'S pupils, RENUCCI, who had seen dextrous peasants in his native Corsica eliciting the coy Sarcoptes from its burrow, put matters right by extracting and demonstrating the true itch-mite before distinguished scientific assemblies in Paris. RASPAIL then seems to have gone too far, since he fancied that the creature penetrated into the human interior and there gave origin to serious disorders, including syphilis. In 1834 Albin GRAS gave himself itch by transferring live mites to his arm. In 1836 AUBÉ discovered the nocturnal habits of Sarcoptes. In 1844 HEBRA described the gallery of the female mite, and later he expressed the opinion that the itch-mites infesting animals were identical with the itch-mite of man—an opinion shared by MEGNIN. EICHSTEDT, in 1846, is said to have been the first to communicate the itch-mite of man to the horse and *vice versa*; also to have first described the arrangement of the eggs in the

mite's gallery. KRAEMER (*Virchow's Archiv.* 1872) was the first to describe the male itch-mite seen by him in 1845. In 1848 BOECK and DANIELSSEN brought to light the variety of Sarcoptes that causes Norwegian itch where the female lives in the crusts and not in burrows.

Among the latest references to the history of the itch-mite and the itch the author gives CUMSTON, "Some Remarks on the History of the Discovery of the Acarus scabiei" (*Brit. Jl. Dermatol.* 1924), and PERNET, "Historical Notes on Scabies with Remarks on the Palaeontology of the Acarus" (*Ibid.* 1925).

A. Alcock.

RABIES: A REVIEW OF RECENT ARTICLES. VIII.*

It is natural that interest during the last six months should have centred to a considerable extent on the transactions of the International Rabies Conference. Reports of a general nature are furnished by ICHOK[1] and GERLACH[2]. REMLINGER[3] discusses the possibility of introducing a standard method of treatment. PRAUSNITZ[4] gives an admirable resumé of the evidence brought forward regarding the efficacy of the various methods of treatment, and their liability to cause paralytic accidents. FERMI[5] criticizes some of the resolutions which were adopted. I shall deal with the last three papers forthwith, although they should naturally fall under their appropriate headings in the classification which I have adopted in writing these reviews. Whilst admitting that procedure must vary to some extent according to local requirements, such for example as differences in the type of biting animal, in the severity of biting, in lateness of arrival, and in the proportion of persons bitten on the bare skin, and that consequently a standard degree of success is not to be expected, REMLINGER[3] is convinced that a survey of strains of virus which have been considered to be different in type will prove on closer examination that they are identical with the classical virus, as was the case in the examination of the virus of Oulou-Fato. He therefore urges the adoption of a single strain of fixed virus. A resolution in this sense was adopted by the Conference. Standardization of the breed of rabbits was urged by BUSSON, but this would be difficult if not impossible to achieve. The criteria requisite in a method of treatment which could be adopted as a standard would be, efficiency, economy, adaptability to different conditions, and lastly and essentially that accidents of treatment should be reduced to a minimum. There appears to be no essential objection to the adoption of a standard method. Large experimental tests are necessary both for the preparation and standardization of the fixed virus to be employed, and also for the selection of the best method of employing it as a medicament. When the work has been completed, the results should be discussed at a subsequent Conference. If these results are achieved the recent Conference will have attained its object.

PRAUSNITZ'[4] communication deals in particular with the evidence which was actually presented at the Conference regarding these points. The potency of the strains of fixed virus appears to differ to some extent. Polyvalent vaccines are employed in only two institutes. After describing in detail the various methods of treatment, he gives a statistical table which summarizes the evidence presented regarding efficiency

---

1 ICHOK (M. G.). Les problèmes actuels de la rage.—*Rev. d' Hyg. et de Méd. Préventive* 1927. July. Vol. 49. No. 7. pp. 516–528. [14 refs.]

2 GERLACH (F.). Die internationale Lyssakonferenz in Paris.—*Prager Arch. f. Tiermedizin u. vergleich. Path.* 1927. June 15. Vol. 7. Part B. No. 6. pp. 167–173.

3 REMLINGER (P.). Est-il possible de standardiser le traitement antirabique?—*Bull. Acad. Méd.* 1927. Year 91. 3rd Ser. Vol. 98. No. 29. pp. 82–88. [2 refs.]

4 PRAUSNITZ (Carl). Ergebnisse der Internationalen Tollwutkonferenz in Paris vom 25–30 April, 1927.—*Cent. f. Bakt.* Ref. 1927. Vol. 87. pp. 529–548.

* For the seventh of this series see Vol. 24, pp. 760–770 and for the Resolutions adopted by the International Rabies Conference pp. 483-6.

and liability to accident in institutes at which more than 1,000 patients have been treated. He has extracted the figures from the various answers to the questionary and as they are valuable for reference, I give the table *in extenso* (see pp. 198-199). He draws attention to the fact that the conditions at different institutes differ widely, in the variety of biting animal, (dog, wolf, jackal, etc.), in the age of population treated, in differences of clothing, in distances over which patients have to travel before their treatment can be commenced, etc. These differences are well brought out in the Indian statistics which relate to patients 90 per cent. of whom are indigenous and 10 per cent. European. The mortality amongst the Indians, who are usually bitten on the bare skin, more frequently by jackals, and who arrive later for treatment, is about 1 per cent., whereas for Europeans it is about 0·4 per cent. Since the duration of treatment varies widely (6 days at Novisad, to 39 days at Palermo), the reduced mortality (failure rate) is not a satisfactory measure of efficacy of treatment. He then goes on to discuss paralytic accidents, and draws attention to the fact emphasized at the Conference by PFEIFFER, NEUFELD, HEMPT, and MCKENDRICK that fresh living virus in exceptional cases may be nocuous. PRAUSNITZ concluded from the evidence of the figures, "that for practical purposes one may conclude that inoculation with even large doses of fixed virus which has been absolutely killed, reduces the liability to accident to a minimum." This applies to the carbolized vaccine of SEMPLE, and to the carbolized ether virus now employed by HEMPT. French observers consider CALMETTE'S glycerinated cord method to be harmless, but this was not the experience of PRAUSNITZ, who employed it in Breslau. These points were brought out at the Conference during the course of debate.

FERMI[5] repeats his argument in favour of carbolized vaccines.

i. *Virus.* Before reviewing work on rabies in particular, attention may be drawn to an article on filtrable viruses in general by RIVERS[6]. I understand that this critical review may be taken as authoritative and reflecting the opinions held at the Rockefeller Institute. Over fifty conditions have been ascribed to filtrable viruses by different workers. With few exceptions recovery (if such occur) is followed by a lasting immunity. No virus has been obtained in an absolutely pure state; nevertheless attempts have been made to determine the size of a few viruses. The order of size appears to be about 30 $\mu\mu$. Numerous claims have been made that viruses have been successfully cultivated *in vitro*. In general it can be said that no worker has proved that a filtrable virus can be cultivated in the absence of living cells. They appear to be obligate parasites, in the sense that their reproduction is dependent upon living cells. Whether this reproduction occurs intra or extra cellularly is a debated question. A certain degree of selective tissue localization is apparent (e.g., rabies in brain). Many viruses produce characteristic microscopic changes as evidenced by the presence of inclusion bodies in the nuclei or cytoplasm of affected cells. These are indicative of the presence of the virus, though their nature has not

---

5 FERMI (Claudio). Metodi antirabbici Pasteur, Fermi e Roux Remlinger alla conferenza internazionale della societa' della nazioni.—*Riforma Med.* 1927. July 4. Vol. 43. No. 27. pp. 625–629. [1 ref.]

6 RIVERS (T. M.). Filterable Viruses. A Critical Review.—*Jl. of Bact.* 1927. Oct. Vol. 14. No. 4. pp. 217–257. With 1 plate. [410 refs.] [Hosp. of the Rockefeller Inst., New York.]

yet been definitely determined. Some investigators consider them to be products of degeneration, others hold that they are the virus itself, and yet others think of them as virus surrounded by a mantle of altered cellular material. Attempts to produce such inclusions artificially have been unsuccessful. Some, though not all, filtrable viruses are more resistant to glycerine than are ordinary bacteria ; all are inactivated by high temperatures. The question of the organized or corpuscular nature of the viruses remains unsettled. Such granules as have been seen may not represent virus alone. Viruses have a remarkable tendency to become adsorbed by particles with which they come in contact. No evidence of respiration has been observed on the part of the rabies virus, amongst others, in the absence of living host cells (BRONFENBRENNER[1]. It is at present impossible to say whether the viruses are animate or inanimate. Many of the viruses may be closely related or some may have evolved from a common ancestor. Experiments on cross immunization may easily mislead if one is not cognizant of the difficulties usually encountered in this field of work. BUSSON considered that the protection which he observed with vaccine virus against rabies infection was non-specific.

The author concludes as follows : In the majority of virus diseases a close relationship exists between the etiological agent and the cells of the host. This intimate type of parasitism is emphasized by the fact that some of the diseases exhibit a striking species specificity, that the viruses have resisted cultivation in the absence of living cells, that characteristic or specific pathological changes are frequently observed in cells affected by viruses, and, finally, that a host once recovered from a virus disease usually exhibits a lasting immunity.

BLONDIN, WILBERT and DELORME[7] enquire into the existence of rabies in French West Africa in the light of the results which have been obtained regarding Oulou-fato in Central Africa. No case has been reported from the Ivory coast, but the authors report two cases, one from Ouagadougou which presented the clinical picture of furious rabies, and a second from Niafunke, which induced paralysis on the 11th day when inoculated into a rabbit.

MANOUELIAN and VIALA[8] have found formations in the brains of young dogs suffering from encephalomyelitis, which they designate the *Encephalitozoon Negrii*. These are similar to Encephalitozoon cuniculi, and rabei, in their staining and morphological characters. They are present in the salivary glands, and in the horn of ammon.

LÄSSER[9] reports cross-immunization experiments in which the sera were those of rabbits, normal, or infected with fixed and street virus, and also from cases of distemper, Borna's disease, and Koritschoner's encephalitis, whilst the extracts were variously prepared from rabies brains and other neurotropic viruses. Precipitation was observed

---

7 BLONDIN, WILBERT (R.) & DELORME (M.). Contribution à l'étude de la rage en A.O.F.—*Bull. Soc. Path. Exot.* 1927. May 11. Vol. 20. No. 5. pp. 404–407. [5 refs.]

8 MANOUELIAN (Y.) & VIALA (J.). *Encephalitozoon Negrii*, parasite de l'encéphalo-myélite des jeunes chiens.—*C.R. Acad. Sci.* 1927. Mar. 7. Vol. 184. No. 10. pp. 630–632.

9 LÄSSER (Pius). Zur Diagnose der Lyssa durch Präzipitation.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1927. Sept. 26. Vol. 53. No. 1. pp. 1–11. [10 refs.] [Federal Animal Disease Control Inst., Mödling, Vienna.]

with specific extracts, with normal brain antigen, and with the antigens of other neurotropic viruses. There was no evidence of any specificity.

CUNNINGHAM, NICHOLAS and LAHIRI[10] report upon the action of ether upon street virus. The action of ether on fixed virus was dealt with in a previous paper (this *Bulletin*, Vol. 24, p. 229). Street virus appears to be more resistant to the action of ether than the Kasauli strain of fixed virus. In the case of street virus, virulence was maintained up to 72 hours immersion in ether, and even after 120 hours immersion; some cases with long incubation periods were observed amongst the test animals. The action of ether vapour was similar but less even.

KAWATANI and OKUWADA[11] found that centrifugation at 3,200 to 3,500 revolutions per minute did not completely separate the virulent portion out of an emulsion of brain substance in 0·85 saline; but that the upper layers of the resultant suspension were less toxic than the deeper.

The statement by GRJASNOV (this *Bulletin*, Vol. 23, p. 199) that the rate of loss of virulence is increased with oxygenation has been examined by ISABOLINSKY and ZEITLIN,[12] and by BARONI[13]. The former workers failed to demonstate any difference in the time of preservation with or without oxygenation. BARONI, however, supports GRJASNOV. Powdered vaccines were obtained by reducing brain substance to a pulp, and then grinding in varying proportions of calcined magnesium sulphate. Before use this powder was mixed with distilled water in the proportion of 1 to 25, and gross particles were allowed to subside; the supernatant fluid was injected subdurally or into the anterior chamber of the eye. The author considers that the rapidity of desiccation was due to an increase in the surface in contact with air. Loss of virulence was almost immediate when the salt was in excess, it occurred within 24 hours when brain pulp and salt were in equal proportions, and in 3 to 6 days when the salt was in defect. In addition it was found that the virulence of powdered vaccines could be maintained up to 3½ months when all air contact was avoided, as for example by mixing and preserving in cocoa butter. According to BARONI, VANSTEENBERGHE (1903) was the first to note the influence of oxygen upon loss of virulence.

ii. *Clinical.* In the *U.S. Naval Medical Bulletin*[14] are described two cases of hydrophobia. The second was considered to be one of street virus infection, although the symptoms simulated those of an

---

[10] CUNNINGHAM (J.), NICHOLAS (M. J.) & LAHIRI (B. N.). An Investigation into the Value of an Etherised Vaccine in the Prophylactic Treatment of Rabies. Part II. The Action of Ether on 'Street Virus' in Infected Brains.—*Indian Jl. Med. Res.* 1927. July. Vol. 15. No. 1. pp. 85–88. [3 refs.]

[11] KAWATANI (Saneto) & OKUWADA (Shyoichi). [On the Attitude of the Lyssa Virus against Centrifugalization.]—*Saikingaku Zasshi* (*Jl. of Bact.*) 1926. June. No. 364. [Summarized in *Japan Med. World.* 1927. July 15. Vol. 7. No. 7. pp. 208–209.

[12] ISABOLINSKY (M.) & ZEITLIN (A.). Ueber die biologischen Eigenschaften des Virus fixe. II. Mitteilung.—*Cent. f. Bakt.* I. Abt. Orig. 1927. Sept. 10. Vol. 103. No. 6-8. pp. 427–429. [5 refs.] [State Bact. Inst. & Univ. Lab., Smolensk.]

[13] BARONI (V.). Action de la dessiccation rapide du cerveau rabique au moyen du sulfate de magnésie anhydre sur le virus fixe.—*C.R. Soc. Biol.* 1927. Oct. 13. Vol. 97. No. 26. pp. 1022–1024. [1 ref.]

[14] UNITED STATES NAVAL MEDICAL BULLETIN. 1927. Oct. Vol. 25. No. 4. pp. 1020–1021.—Two Deaths from Rabies contracted by playing with a Dog which was incubating the Disease in Hankow, China.

acute ascending paralysis of the Landry type. LOPES[15] describes a case in which the diagnosis was doubtful, and goes on to discuss pseudo-rabies psychoses in general.

iii. *Pathology.* Following the line of research of SPERANSKY (this *Bulletin*, Vol. 24, p. 764), PONOMAREFF and TCHECHKOFF[16] examine the conditions under which antirabic serum acts within the body. It is well known that antirabic serum can act *in vitro* but that it is ineffective *in vivo*. The authors ascribe this difference to the difficulty of assuring the penetration of the serum into the cerebral tissue in order that it may come into contact with the virus. Two methods of overcoming this difficulty are described. According to the former the cerebrospinal fluid at the base of the brain is partially evacuated immediately before introduction of the serum. It is claimed that this method is successful and that rabies does not develope, but the number of experiments is not stated. The second consists in causing a rapid oscillation of intracranial pressure, with the object of mechanically removing the "haematoencephalic barrier." This is attained by puncturing the serous cavity and then filling and emptying the syringe two to four times in rapid succession, the last portion being rejected.

YASUYAMA[17] finds that a course of antirabic treatment does not alter the haemolytic or agglutinative action of human serum upon the red blood cells of the guineapig or the rabbit. Towards the end of treatment slight traces of complement fixation were observed in mixtures of the patient's serum and rabbit brain protein.

JONNESCO[18] repeated PHISALIX's experiments (this *Bulletin*, Vol. 23, p. 694) on the rabicidal properties of the serum of the hedgehog. From experiments on thirty rabbits, he concludes that the hedgehog possesses some resistance against both fixed and street virus, and that certain exceptional individuals may be refractory. He has never been able to demonstrate neutralization of fixed virus by the serum of the hedgehog either *in vitro* or *in vivo*.

Three papers deal with the haematology in declared rabies and during the course of treatment. JONNESCO and VALTER [19,20] in the former condition observed a polycythaemia, an increase of viscosity and of the venous blood pressure, a polymorphonuclear leucocytosis with a displacement of the Arneth count to the left. A general diminution of peroxidases ran parallel with the Arneth deviation. In a second paper JONNESCO, VALTER and TEODOSIU [21] describe a sudden fall of

---

15 LOPES (I. Cunha). Psychose pseudo-rabica.—*Arch. Brasileiros de Med.* 1927. Aug. Vol. 17. No. 8. pp. 775–778.

16 PONOMAREFF (A.) & TCHECHKOFF (A.). Les conditions de l'action du sérum antirabique dans l'organisme.—*C. R. Soc. Biol.* 1927. July 8. Vol. 97. No. 22. pp. 376–378. [Inst. Exper. Med., Leningrad.]

17 YASUYAMA (K.). Inquiry into the Serologic Side-Effects of the Antirabic Preventive Treatment.—*Philippine Jl. Sci.* 1927. July. Vol. 33. No. 3. pp. 233–248.

18 JONNESCO (Démètre). Sur la valeur rabicide du sang de Hérisson.—*C. R. Soc. Biol.* 1927. Oct. 13. Vol. 97. No. 26. pp. 974–975. [2 refs.]

19 JONESCO (Démètre) & VALTER (Basil). Recherches hématologiques et cliniques dans la rage humaine.—*Haematologica.* 1927. Vol. 8. No. 3. pp. 213–220. [6 refs.]

20 IONESCO (Démètre) & VALTER (Basil). Contribution à l'étude hématologique et clinique dans la rage humaine.—*Bull. et Mém. Soc. Méd. Hôpit. de Bucarest.* 1927. Mar. Vol. 9. No. 3. pp. 47–54. [8 refs.]

21 JONNESCO (Démètre), VALTER (V.) & TEODOSIU (T.). Recherches hématologiques pendant le traitement antirabique et au cours de la rage humaine.—*C.R. Soc. Biol.* 1927. Oct. 13. Vol. 97. No. 26. pp. 983–986.

eosinophils and an increase in polymorphonuclear leucocytes as occurring two days before the appearance of symptoms, followed during the course of the disease by a reduction of the former and a continued increase of the latter.

DESPONTIN[22] from a systematic examination of a number of treated patients and guineapigs considers the observed polymorphonuclear leucocytosis to be so slight as to be of little value.

In a previous paper (this *Bulletin*, Vol. 24, p. 225), BIGLIERI and VILLEGAS emphasized the view that immunity against rabies did not depend upon the constituents of the blood, but upon the cellular elements of the nervous tissue. BIGLIERI, VILLEGAS and OYARZABAL[23] present further evidence in support of this view. Experiments *in vitro* showed that contact for 24 hours with leucocytes or leucocytic extracts had no rabicidal effect upon fixed virus. From *in vivo* experiments they found that a local leucocytosis in the anterior chamber of the eye or a general leucocytosis were similarly ineffective. Inhibition of phagocytosis, by treatment with such drugs as quinine, produced no modification in the course of the disease.

iv. *Statistics.* KOLDAJEW[24] furnishes interesting figures from *Kiev* relating to the results of treatment, by various methods, during the last 30 years.

	Bitten.	*Deaths.*	*Failures.*
(1) 1896–1909 Dried cords ...	19,816	136 (0·69%)	46 (0·23%)
(2) 1909–1919 Intensive cords ...	39,151	153 (0·39%)	47 (0·12%)
(3) 1919–1924 Dried cord + ... dilutions* ...	9,102	27 (0·30%)	7 (0·08%)
(4) 1924–1926 Dilutions	9,793	10 (0·10%)	0 (0·00%)

* In the treatment of this group 3 cc. of a 1-400 dilution was substituted for 1 day dried cord, and 3 cc. of a 1-600 dilution for a 2 day dried cord.

The complications which occurred may be classified as follows. The group numbers are as before.

	Bitten or licked.	*Accidents.*	
		Total Per cent.	*Fatal.*
(1)	22,721	6 0·027	4 (66%)
(2)	44,668	12 0·027	4 (33%)
(3)	10,403	0 0	0
(4)	13,486	17 0·126	14 (85%)

22 DESPONTIN (Augusto E.). Modificaciones de la fórmula leucocitaria por el tratamiento antirrábico.—*Semana Méd.* 1927. June 2. Vol. 34. No. 22 (1742). pp. 1342–1353. With 24 charts. [7 refs.]

23 BIGLIERI (R.), VILLEGAS (C.) & OYARZABAL (J.). Acción de los Leucocitos sobre el virus rábico.—*Rev. Inst. Bacteriológ.* Buenos Aires. 1926. July. Vol. 4. No. 5. pp. 544–548.

24 KOLDAJEW (B.). Ergebnisse der antirabischen Impfungen nach der Pasteurschen und der "Verdünnungs"-Methode.—*Ztschr. f. Hyg. u. Infektionskr.* 1927. July 25. Vol. 107. No. 3-4. pp. 523–542. [28 refs.] [Bact. Inst. Kiev.]

The author concludes that the dilution method is more efficient than that of dried cords, that accidents occur with both, but more frequently and more fatally with fresh dilutions. From a closer analysis of his figures KOLDAJEW was unable to confirm VAN GENDEREN's view that prevalence of post-vaccinal complications is related to the dose of fixed virus employed.

During 1926 1,417 patients were treated at *Shillong* (Assam[25]); of these, 14 contracted rabies (0·99 per cent.), and 6 were failures (0·42 per cent.).

KII[26] reports from *Tokyo* that 5,875 patients were treated by dried cords within the period 1915–1926. Of these 13 died. Two paralytic accidents occurred; these are described in detail by MIYAGAWA.[27]

Of 415 persons treated at *Coonoor*[28] during the year 1926–1927, 4 contracted rabies, of whom 3 were failures. Of 4,373 persons treated in out-districts by vaccine supplied by the Coonoor Institute 25 (0·57 per cent.) contracted rabies, of whom 17 (0·38 per cent.) were failures. The statistical tables set out in this report are unfortunately not of the detailed character adopted in other Indian Institutes. This is regrettable as it renders it impossible to deal with Indian Statistics as a whole.

v. *Rabies in Animals.* AUJESZKY[29, 30] reports from Hungary that during the period 1900–1925 a total of 9,328 animals had been given antirabic treatment by HÖGYES method. The total dose was 0·2 to 0·79 gm. of fixed virus brain, distributed at first in 10 to 12 inoculations over a period of 25 days, and latterly in 8 to 9 inoculations over a period of 8-11 days. Of the total of 9,328, 3,688 were cattle, 3,671 pigs, 1,349 sheep, 572 horses, 34 goats, 6 asses, 3 mules and 5 geese. It was estimated that 90 per cent. of these were at certain or probable risk. The cases were followed up over a period of six months. Of 8,989 animals which had received a full course of treatment, and which had been actually bitten, 184 contracted rabies (2 per cent.). The failure rate was 0·51 per cent. Some interesting observations upon incubation periods may be quoted.

KINGSBURY[31] reports that interstate quarantine regulations are in operation in Malaya, dogs being segregated for a period of six months. This controls the movements of dogs by rail or road, but the wandering of stray dogs cannot be prevented. UMENO and DOI's method of

---

25 ASSAM. King Edward VII Memorial Pasteur Institute and Medical Research Institute, Shillong. The Tenth Annual Report for the Year ending 31st December 1926. [VARDON (A. C.).]—25 pp. 1927. Shillong: Govt. Press. [12 annas.—1s. 6d.]

26 KII (N.). Answers to the Questionnaire relating to Anti-Rabic Vaccination.—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1926. Vol. 5. pp. 103–107.

27 MIYAGAWA (Y.). Answers to the Questionnaire relating to Anti-Rabic Vaccination. Accidents of Anti-Rabic Treatment.—*Ibid.* pp. 109–111.

28 COONOOR, SOUTHERN INDIA. Pasteur Institute. The Annual Report of the Director [GLOSTER, T. H.] together with the Twentieth Annual Report of the Central Committee of the Association for the Year ending 28th February 1927.—30 pp. 1927. Madras. [For official use only.]

29 AUJESZKY (A.). Wutschutzimpfung der Haustiere in Ungarn.—*Deut. Tierärzt. Woch.* 1927. June 18. Vol. 35. No. 25. pp. 399–402. [8 refs.]

30 AUJESZKY (A.). [Statistische Ergebnisse der antirabischen Wutimpfung Ungarn.] —*Allat. Lapok.* 1926. No. 22. p. 283. [Summarized in *Bull. Inst. Pasteur.* 1927. July 31. Vol. 25. No. 14. p. 644.]

31 KINGSBURY (A. Neave). On Canine Anti-Rabies Vaccination in Malaya.—*Malayan Med. Jl.* 1927. June. Vol. 2. No. 2. pp. 48–49. [Inst. Med. Research, Kuala Lumpur.]

prophylactic vaccination has been adopted as a voluntary measure. In the year 1925 over 650 dogs received treatment, i.e., about one-twelfth of the estimated canine population. None of these died, whilst 8 deaths were reported amongst the unvaccinated. In 1926, rabies spread over the Malaccan boundary into Negri Sembilan. Prophylactic vaccination was administered to 250 dogs, one of which subsequently contracted the disease.

Incubation.	*Horses.*	*Cattle.*	*Pigs.*
11 to 14 days ...	2 (7·1%)	2 (1·2%)	16 (24·2%)
15 to 30 ,, ...	12 (42·9%)	74 (45·4%)	24 (36·3%)
31 to 45 ,, ...	9 (31·1%)	32 (19·6%)	13 (19·6%)
46 to 60 ,, ...	3 (10·7%)	20 (12·3%)	4 (6·0%)
61 to 90 ,, ...	—	18 (11·0%)	7 (10·6%)
91 to 120 ,, ...	—	8 (4·9%)	1 (1·5%)
121 to 150 ,, ...	—	2 (1·2%)	—
151 to 180 ,, ...	1 (3·6%)	1 (0·6%)	—
181 to 210 ,, ...	—	3 (1·9%)	1 (1·5%)
211 to 300 ,, ...	—	3 (1·9%)	—
330 ,, ...	1 (3·6%)	—	—
Total	28	163	66

Regarding the prevalence of canine rabies in Uruguay, FREIRE MUÑOZ[32] reports that during the period 1921–1925, 4,920 bitten dogs have been from time to time under observation; of these, 187 developed rabies, i.e., 3·8 per cent. Negri bodies were found in the brains of 146 out of a total of 202 dogs which had died of rabies.

THOMAS[33] writes that 30 dogs' brains have been examined in Haiti, and that 18 of these were positive. He then discusses rabies in general for the benefit of local readers, and pleads for the destruction of stray dogs.

A further report regarding the prevalence of rabies in South Africa, (see this *Bulletin*, Vol. 24, p. 760), is submitted by CLUVER[34]. Since 1916, 11 cases of human rabies have been reported. These may be classified as follows.

Date	*District.*	*Biting Animal.*
1916 (2 cases)	Heilbron O.F.S.	Mongoose.
1920	Frankfort O.F.S.	Mongoose?
1923	Vredefort O.F.S.	Dog.
1924	Middleburg Tvl.	Mongoose.
1925	Bloemfontein O.F.S.	Dog.
1926	Wolmaransstad Tvl.	Mongoose.
1926	Vryburg C.P.	Genet cat
1926 (2 cases)	Ermelo Tvl.	Dog.
1927	Standerton Tvl.	Dog or Mongoose.

32 FREIRE MUÑOZ (Carlos). La rabia y su profilaxis. (Trabajo recomendado por la IV Conferencia Anual de Policia Veterinaria).—*Rev. Hig. y. San. Pecuarias.* 1927. Nov. Vol. 17. No. 11. pp. 819–835.

33 THOMAS (G. C.). La rage en Haiti.—*Bull. Soc. Méd. d' Haiti.* 1927. July. Vol. 1. No. 3. pp. 57–64.

34 CLUVER (Eustace). Rabies in South Africa.—*Jl. Med. Assoc. S. Africa.* 1927. May 28. Vol. 1. No. 10. pp. 247–253. [5 refs.]

Thus in four (possibly five) cases the biting animal was the yellow mongoose, known in South Africa as the Witpuntstert meerkat or geel meerkat : Latin—*Cynictus penicillata* : whilst in one case the spotted genet (moseljatkat or thsepa : Latin –*Genetta felina*) was responsible. All these cases occurred in the northern portion of the Union. None of the recent South African cases have yet been confirmed by pathological examination. Antirabic vaccine is kept in stock at Capetown and Johannesburg. This is a carbolized vaccine prepared according to the Indian formula. It may be obtained on application.

PLANTUREUX[35] gives further evidence in support of vaccination of dogs by formolized vaccines (this *Bulletin*, Vol. 24, p. 227). Of 24 dogs so treated three-quarters have resisted infection by a dose of 1 in 50 street virus. He states that the vaccine can be employed without risk, and that the soluble toxins are removed by centrifugation.

FINZI[36] finds that for the treatment of herbivora a carbolized glycerine vaccine gives more certain results than an ether vaccine. He gives six injections over a period of three days, the dosage for small animals being 10 cc., and for adult animals 20 cc.

vi. *Paralytic Accidents.* MIYAGAWA and ISHII[37] present evidence in support of the observations of SCHWEINBURG (this *Bulletin*, Vol. 22, p. 250) that paralyses may follow the inoculation of normal brain substance. After intraperitoneal injection of brain and cord emulsions of rabbit and ox, into albino rats, and after subdural injection of similar emulsions into rabbits, paralysis of varying degree were observed in a considerable proportion of the inoculated. The brain substance of the rabbit appeared to be more potent than that of the ox, and subdural inoculation appeared to cause accidents more frequently than inoculation by the intraperitoneal route. As a control experiment similar injections were made with liver emulsion into 33 animals, and in these no untoward effects were observed. The figures are as follows.

Intraperitoneal injection of Rabbit cerebrum into 6 albino rats, 4 paralyses.
Intraperitoneal injection of Rabbit cerebrum & medulla into 9 albino rats, 6 paralyses.
Intraperitoneal injection of Rabbit cord into 9 albino rats, 6 paralyses.
Intraperitoneal injection of Ox cerebrum into 9 albino rats, 9 paralyses.
Intraperitoneal injection of Ox cerebellum into 8 albino rats, 6 paralyses.
Intraperitoneal injection of Ox cord into 6 albino rats, 6 paralyses.
Subdural injection of Ox cerebrum into 7 rabbits, 7 paralyses.
Subdural injection of Ox cerebellum into 7 rabbits, 7 paralyses.
Subdural injection of Ox cord into 7 rabbits, 7 paralyses.

The quantities inoculated varied, as also did the number of injections. It is impossible in the space at my disposal to give these in detail, but it may be stated that the total amounts injected into rabbits were of the order of 1 to 2 gm. Histological examinations were made in each instance and these are described in detail.

---

35 PLANTUREUX (E.). Vaccin antirabique formolé nouvelle méthode, simple et pratique de vaccination préventive des chiens contre la rage.—*Rec. Méd. Vét.* 1927. July 30. Vol. 103. No. 14. pp. 288–292. [4 refs.] [Pasteur Inst., Algiers.]

36 FINZI (G.). [Nuove applicazioni e nuove osservazioni sulla vaccinazione antirabica dei grandi erbivori.]—*Critica Zootec. e Sanit.* 1926. May. No. 5. 10 pp. [Summarized in *Bull. Inst. Pasteur.* 1927. July 31. Vol. 25. No. 14. pp. 644–645.]

37 MIYAGAWA (Y.) & ISHII (S.). On the Influence of the Constituents of Central Nerve Cells parenterally injected into the Living Organism.—*Scientific Reports. Govt. Inst. Infect. Dis.* Tokyo. 1926. Vol. 5. pp. 331–371. With 3 plates. (2 coloured) [24 refs.]

REMLINGER and BAILLY[38] attempted to produce accidents in dogs by subjecting them to prolonged treatment by Calmette's method. One out of six dogs which received daily doses of 2 gm. over a period of 101 days showed symptoms of paralysis. It appeared then that such treatment may cause paralysis in certain susceptible animals, but that the liability to accident is not increased by prolongation of the treatment. The proportion of 1 in 6 is similar to that previously observed (this *Bulletin*, Vol. 24, p. 766). The authors proceeded to inoculate one rabbit and one guineapig with an emulsion from each of the brains of four of the survivors of the above experiment: all remained well, showing that the fixed virus had not passed into the nervous system of these animals.

Joseph KOCH [39] contributes the first part of an historical review of the whole subject of paralytic accidents. He describes in detail the controversy which raged during the life of PASTEUR; and the later work of GAMELEIA. The résumé is well worthy of study.

vii. *Miscellaneous.* Criticizing the work of DAMMAN and HADENKAMP who stated that the saliva of a dog infected with fixed virus may be infective even when the animal does not contract the disease SCHNÜRER[40] states that since 1905 he has made many attempts to produce rabies by the subdural injection of parotid gland emulsion of dogs which had died of fixed virus rabies, without success.

RAMON has shown that a previous inoculation of tapioca or of pyogenic microbes at the point of injection of toxins of diphtheria and tetanus causes an inflammatory reaction as a result of which the degree of antitoxin production is increased. REMLINGER and BAILLY[41] have applied this method to rabies, and have found that abscess formation has no influence either upon the production of rabicidal substances in the blood, or in increasing protection. This confirms the observations of PEREIRA DA SILVA who, as stated in a communication read before the Rabies Conference, used tapioca injections in the case of six men without advantage. It does not appear that the method of RAMON is applicable to antirabic treatment.

ELBERT, JOWELEW and SSUTIN[42] state that the introduction of treatment centres in West Russia has led to an increase in local interest in

---

38 REMLINGER (P.) & BAILLY (J.). Effets chez le chien d'un traitement antirabique démesurément prolongé (101 jours).—*C.R. Soc. Biol.* 1927. July 8. Vol. 97. No. 22. pp. 351–353. [2 refs.] [Pasteur Inst., Morocco.]

39 KOCH (Jos.). Ueber paralytische, atypische, abortive und die sogenannte Impfwut. Zugleich ein Beitrag zur Geschichte der Pasteurschen Schutzimpfung und eine Entgegung auf die in den letzten Jahrzehnten erschienenen Arbeiten ueber die Gefährlichkeit dieses Verfahrens.—*Cent. f. Bakt.* I. Abt. Orig. 1927. Oct. 31. Vol. 104. No. 5-6. pp. 381–409. [" Robert Koch " Inst. Berlin.]

40 SCHNÜRER (Josef). Ueber die Ansteckungsfähigkeit des Speichels von Hunden nach Impfung mit virus fixe.—*Berlin. Tierärzt. Woch.* 1927. Nov. 11. Vol. 43. No. 45. p. 749.

41 REMLINGER (P.) & BAILLY (J.). Les abcès favorisent-ils la production de l'immunité antirabique et des substances rabicides?—*C.R. Soc. Biol.* 1927. July 1. Vol. 97. No. 21. pp. 236–238. [1 ref.] [Pasteur Inst., Morocco.]

42 ELBERT (B.), JOWELEW (B.) & SSUTIN (J.). Erwägungen und Erfahrungen ueber die Dezentralisation der Tollwutschutzimpfung.—*Cent. f. Bakt.* I. Abt. Orig. 1927. July 1. Vol. 103. No. 1-3. pp. 65–73. [White Russian State Bact. Inst., Minsk.]

antirabic measures. The number of persons treated has increased; delay in arrival is reduced; measures of dog control are more readily accepted in the areas served. The Phillips method is employed.

From the time of PASTEUR onwards, the possibility of spontaneous recovery from rabies has been recognized. The historical evidence has been reviewed by LEHR[43], who now reports a further case. Histological examination of a brain of a dog which, after developing paralysis, had died with symptoms suggesting a diagnosis of rabies, revealed no definite evidence of rabies infection. Two rabbits were inoculated with an emulsion prepared from this brain. The first of these showed symptoms of slight paralysis on the 10th day after inoculation. By the 13th day the paralysis had extended and the animal presented every appearance of rabies. On the morning of the next day the authors were astonished to find that symptoms had disappeared and the rabbit appeared to be healthy. The rabbit was killed on the evening of the 14th day. No pathological changes of any sort were observed. A subpassage was made into a further rabbit, and after 7 days this rabbit died without having exhibited any symptoms of paralysis. On pathological examination Negri bodies were found in its brain. The second rabbit inoculated from the brain of the original dog became paralysed on the 29th day, died on the 33rd day, and a pathological examination revealed Negri bodies.

A. G. McKendrick.

ANDERSON (C. M.). Rabies in Ontario.—*Public Health Jl.* Toronto. 1926. Sept. Vol. 17. No. 9. pp. 448–456. [*v. Bull. of Hyg.* Vol. 2. p. 377]

AVEZZÙ (G.). [Rabies.]—*Arch. di Biol.* Genoa. 1927. May-June. Vol. 4. p. 27. [Summarized in *Jl. Amer. Med. Assoc.* 1927. Nov. 12. Vol. 89. No. 20. p. 1729.]

KARŁOWSKI (Zenon). [In Polish.] Stan współczesny wiedzy o wściekliznie a szczepienia leczniczo-ochronne. L'état actuel des connaissances sur la rage et la vaccination.—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1927. Vol. 7. No. 5–6. pp. 435–450. With 2 figs.

VAN DEN HOVEN VAN GENDEREN (Jeanne). Results obtained by Treatment with Fixed Virus killed by Carbolic Acid. Remarks on the British Indian Statistics on Antirabic Treatment and on Lyssa Statistics in general.—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1927. Part 3. pp. 457–475. [5 refs.] [Pasteur Inst., Bandoeng, Java.] [This *Bulletin*, Vol. 24, p. 767.]

---

43 LEHR (E.). Ein Beitrag zur Frage der Selbstheilung der Tollwut bei Tieren.—*Arch. f. Wissenschaft. u. Prakt. Tierheilk.* 1927. Sept. 6. Vol. 56. No. 4. pp. 372–377. [11 refs.] [State Veter. Research Inst., Potsdam].

Institute.	Period.	Method of Inoculation.	Duration of treatment, days.	Num treat
			A.	*Dried c*
Algiers	1894–1926	Dried 8–2[1]	14–21	35,
Bangkok ...	1913–1926	Dried 8–2 ; Gly. 2–20	16–25	3,
Bologna	1889–1927	Dried 12–3	15–30	18,
Buenos Aires ...	1886–1926	Dried 10–1	13–21	50,
Keijo, Korea ...	1924–1926	Dried 5–1, Gly.	18	—
Cracow	1892–1926	Dried 6–2, Gly. 2–20	10–16	25,
Lille	1895–1925	Dried 8–2 ; Gly.	18–20	5,
Milan	1889–1926	Dried 5–3	21–36	13,
Palermo	1887–1925	Dried 8–3	27–39	28,
Riga	1914–1926	Dried 1	21	4,
Saigon	1908–1925	Dried at 10°, 6–2 ; Gly. 4–10 ...	21–25	5,
Tananarivo ...	1900–1926	Dried 5–2, severe cases 5–0 ; Gly. at 8°	10–15	2,
Tokyo, Inst. f. Inf.	1915–1926	Dried 3–1	18	5,
,, Kitasato Inst.	1915–1926	Dried 5–1	11–18	4,
Tunis	1894–1925	Dried 4–2	16–20	14,
Warsaw	1886–1925	Dried 4–1	20	42,
Egypt	1906–1926	Cord 1/7–1/3 cm. ; Gly.	15–31	15,
Berlin	1898–1923	Dried 4–1	21	10,
	1923–1926	Phillips 90 mg.[2]	20	1,
Breslau	1906–1912	Dried 3–1	21	1,
	1912–1923	Dried 3–1 ; Gly. 1–14	21	4,
	1923–1926	Phillips 135 mg.	20	1,
Budapest ...	1890–1908	Dried cords, later original Högyes ...	—	40,
	1909–1925	Modified Högyes 65–240° mg. ...	9–21	84,
Kharkow ...	1887–1925	Dried 4–2	10–26	71,
	1926	Phillips 40–214 mg.	7–26	
Columbus (Ohio)	1910–1926	Dried cords	—	1,
		Different dilutions	16–24	3,
		Killed 3 days Phenol then mod. Högyes	—	5,
Vienna	1894–1923	Dried cords	—	15,
	1923–1926	Högyes 237·5 mg. Ether virus in addition in severe cases.	15	1,

[1] The figures give the duration of drying, and of preservation in glycerine respectively
[2] Total quantity of brain substance administered during the whole treatment.

			C.	*Ph*
Rome	1889–1919	Dried cords	—	9,
	1920–1926	Phenol, living, attenuated	20	5,
			D.	*Ph*
Calcutta	1924–1926	Phenol : dead : 280–700 mg. ...	14	11,
Jerusalem ...	1923–1926	Phenol : dead : 280–700 mg. ...	—	2,
Kasauli	1900–1907	Dried cords		Eur. Ind.
	1907–1912	Högyes		Eur. Ind.
	1912–1926	Phenol : dead : 350 later 700 mg.	14	Eur. Ind.
Lemberg	1919–1925	Dried 4–2, severe 4–1	14–21	8
	1925–1926	Phenol : dead	14	2,
Parel, Bombay ...	1922–1926	Phenol : dead : 700 mg.	14	2,
Rangoon ...	1915–1926	Phenol : dead : 700 mg.	14–21	5
Shillong	1917–1925	Phenol : dead : 420–560 mg. ...	14	13,
Novi Sad	1922–1926	Dilutions living fixed virus, later ether attenuated virus.*	—	11
		Ether 96 hours, then 1 per cent. phenol glycerine 21 days. 208 mg. Cord to 2,500 mg. brain.	3–6	5
Sarajevo	1922–1927	Ether 96 hours, then glyc. 1–6 days : 1,000–5,000 mg.*	5–6	2
Jassy	1891–1896	Dried cords	—	
	1896–1908	1 per cent. brain, 80° to unheated ...	16–28	3
	1908–1913	0·3–0·2 per cent. brain, 70° to unheated	12–21	3
	1914–1926	0·1 per cent. brain, 65° to unheated	11–17	22
Bucharest	1888–1926	Dried and heated	—	65

ortality.		Paralytic accidents.				Remarks.
l nt.	Reduced per cent.	Total. absolute.	Total. per cent.	Fatal. absolute.	Fatal. per cent.	
or without glycerine.						
	0·25	2	0·006	0	0	
	—	0	0	0	0	
	0·04	34*	0·183	0	0	* Of the paralyses, 11 only facial.
	—	ca. 30	ca. 0·06	?**	?	**Deaths occurred, no figures given.
	—	0	0	0	0	
	—	15	0·058	1	0·004	
	0·14	0	0	0	0	
	0·84*	2	0·015	0	0	* Mortality calculated on all cases dying after completion of treatment.
	—	5**	0·018	0	0	** Of the paralyses 3 only facial.
	0·05	1	0·024	0	0	
	0·24	1*	0·017	0	0	*Slight paresis in a patient who had [been treated 3 times.
	0·3	1	0·036	0	0	
	—	2	0·034	0	0	
	—	2	0·048	0	0	
	—	?	?	?*	?	*Some doubtful fatal cases in children.
	—	41**	0·095	2	0·005	** 22 paralyses were abortive. One case in a first treatment, but not in a second.
tions.						
	—	11*	0·071	0	0	* 1 paralysis in a 1st & in a 2nd treat.
	0·3	27	0·25	4	0·032	** Mortality: Group A, 0·27; B, 0·2; [C, 0·6.
	0	3	0·17			
	—	2	0·15	0	0	
	—	4	0·084	2*	0·04	* In one fatal paralysis, Street virus [found in cord.
	—	2	0·105	2	0·105	
	—	—	—	—	—	
	0·06	2	0·002	0	0	
	—	10**	0·014	1	0·001	** These paralyses from 1886–1914; for 1914–1918 no figures.
	—	4	ca. 0·2	2	ca. 0·1	
	0	6	0·356	0	0	
	0	0	0	0	0	
	0	2	0·055	—	—	
	—	39	0·247	11	0·062	
		3	0·16			

. These figures refer only to the treatment most lately in use.

virus attentuated.						
*	0·37	0	0	0	0	*Mortality reckoned only on 1,940 cases (1889–1902).
	0·02	0**	0	0	0	** But 1 paralysis in a patient treated outside the institute with killed [phenol vaccine.
virus killed.						
	—	0	0	0	0	
4	0·19	0	0	0	0	
1	—	2	0·103	0	0	Six additional cases treated with dried cord exhibited subjective symptoms.
5	—	3	0·094	0	0	
2	—	6	0·352	6	0·352	
1	—	0	0	0	0	
2	—	2	0·027	1*	0·014	* Symptoms of heart disturbance only.
3	—	1	—	0	—	
1	0·06	10	0·119	1	0·012	
	0	1	0·045	0	0	
7	—	0	0	0	0	
0	0·35	0	0	0	0	
5	0·41	0	0	0	0	
er virus.						
2	0·06**	12	0·105	3	0·026	* In severe cases, a second treatment (1–2 days) after 4 weeks.
		0	0	0	0	** No deaths in last 2,000 cases.
4	0·18	1	0·037	1	0·037	* In severe cases, a second treatment [(2 days) after 4 weeks.
ated virus.						
1	0·32	—	—	—	—	
6	0·12	15	0·452	0	0	
	0	0	0	0	0	
3	0·04	0	0	0	0	
	0·5	—	0·2 to 0·035	?*	?	* Fatal cases occur, number not given.

LEPROSY.

LABERNADIE (V.). La lèpre en Guyane française. Troisième mémoire. [**Leprosy in French Guiana.**]—*Bull. Soc. Path. Exot.* 1927. July 13 & Oct. 12. Vol. 20. Nos. 7 & 8. pp. 623–631; 771–779. [13 refs.]

The first part of this paper was reviewed in this *Bulletin*, Vol. 24, No. 11, p. 906. The present part first gives clinical notes, the most important points brought out being the progressive evolution of the disease, with a more acute course in Europeans, and the tendency for nearly all the cases to be mixed ones, with predominance of skin lesions first and later of nervous lesions. In the early macular stage percussion of the long bones may be painful, loss of the outer third of the eyebrows occurs and the ulna nerve shows signs of irritability. Examination of the subcutaneous branches of the cervical nerves in the neck often reveals hypertrophy only second in frequency to that of the ulnar nerve.

Treatment is also discussed, and the conclusions are come to that colloidal antimony is not effective, eparseno is dangerous, but the ethyl esters of chaulmoogra oil generally give good results, although they fail in some cases. He advocates transforming leper asylums into agricultural colonies with hospitals, and permission for patients to attend dispensaries, by which means the number of cases coming for treatment is greatly increased.

L. Rogers.

LEGER (Marcel). Remarques cliniques sur la lèpre. [**Clinical Notes.**]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 577–579.

This paper is a short commentary on the preceding one in which the writer confirms LABERBADIE's observations on the occurrence of pain on percussion of bones, including the flat ones, and other points.

L. R.

ARCOS (G.). **Contagion and Transmission in Leprosy.**—*Bol. del Hosp. Civil de San Juan de Dios.* Quito. 1926. Nov. –1927. Jan. Vol. 1. p. 19. [Summarized in *Jl. Amer. Med. Assoc.* 1927. Sept. 3. Vol. 89. No. 10. p. 831.]

Among 150 patients in the Piso leprosarium the author has seen no case of conjugal infection. In about 66 per cent. there were other lepers in the family. Lepers may have healthy children, but one leprous couple had six infected children. He succeeded in infecting a macacus monkey by inoculation, a regressive nodule resulting.

L. R.

MEDEIROS (Luiz). A luta contra a lepra no Paraná. [**The Campaign against Leprosy in Paraná.**]—*Archivos de Hyg.* Rio de Janeiro. 1927. May. Vol. 1. No. 1. pp. 161–173. With 8 figs. on 1 folding plate.

In a Table giving the population and the number of lepers in the various districts of the State it is shown that there are some 380 cases,

or less than one per mille. The different decrees which have been promulgated are given verbatim. The paper is illustrated by a plate with excellent photographs of the buildings and arrangements in the leprosarium of São Roque.

H. Harold Scott.

TORRES (Octavio). Epidemiologia e prophylaxia da lepra no Brasil. [**Epidemiology and Prophylaxis of Leprosy in Brazil.**]—*Brasil-Medico.* 1927. Sept. 17. Vol. 41. No. 38. pp. 971–975. [Faculty of Med., Bahia.]

In former times, a hundred or so years ago, leprosy was a disease with high relative incidence, but owing to vigorous measures of isolation, segregation, the establishment of asylums, and cessation of slave-traffic, the number of cases at the present day is but small, particularly in Bahia. A questionary sent to various practitioners in the Capital and in the interior led to unanimous reports as to the rarity of the disease. Including records from various hospitals, the number is stated to be under 100, more than half of which are from the Capital, and among them are 20 interned in the Hospital de S. Lazaros. These welcome facts must not lead to relaxation of efforts at eradicating the disease from the State.

H. Harold Scott.

MOREIRA (Manoelito). O problema da lepra. Discurso feito na Camara Federal pelo Deputado Cearense. [**The Problem of Leprosy.**]—*Sciencia Med.* 1927. Aug. Vol. 5. No. 8. pp. 457–461.

This is a report of a discussion which took place in the "Federal Hall" to ventilate opinions on the method of dealing with leprosy in Ceará. The rate of increase of cases in Fortaleza has been rapid. In 1898 there were 32 noted, in 1917 over 150, while in 1924 25 there were 444 registered lepers.

In the leper hospital of San Sebastião from its foundation in 1920 to May, 1927, there had been 2,500 notifications of which 1,569 were confirmed. Of these only 287 were domiciled in the Federal district, and 742 came from the interior.

The result of the meeting was a resolution to ask for the establishment of asylum-colonies in various parts of Brazil, a matter which it was hoped and believed would be sympathetically received by the Government.

H. Harold Scott.

VITÓN (Alfredo). El problema de la lepra en la República Argentina. [**The Problem of Leprosy in the Argentine.**]—*Semana Méd.* 1927. Nov. 3. Vol. 34. No. 44 (1764). pp. 1208–1214.

This paper comprises a general review of leprosy in the Republic, the various points of which have from time to time been dealt with in this *Bulletin.* No new facts are brought forward.

H. Harold Scott.

WOFCY (Isaac). Consideraciones sobre un caso de lepra en Añatuya (Santiago del Estero). [**A Case of Leprosy in Añatuya.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 705–708. With 4 text figs. [Also issued as *3a Reunión Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 597–600 & illustrations.]

The author states that he is recording this case merely because it was met with in a district where leprosy is rare. It was of the maculo-anaesthetic type, but with widespread lesions; the Wassermann reaction was strongly positive. Treatment with the ethyl esters and sodium salts of the fatty acids of chaulmoogra was undertaken at once, and progress is satisfactory. The patient is still under treatment.

H. Harold Scott.

RAE (Wilson). **Leprosy in the Gambia Protectorate.**—*Gambia Ann. Med. & San. Report for the Year 1926.* Appendix III. pp. 66–74.

This interesting report of a leprosy survey of the Colony revealed a much larger number of cases than had been suspected, namely 100, or 1·4 per mille of the population, although considerable areas remain unexplored. The inquiry showed overwhelming evidence of contagion, mostly in families sleeping together in one hut, and often in the same bed, as in cases of schoolboys and others mentioned, but only one conjugal infection was met with. A total of 57 was due to contagion, and this would have been much increased had time permitted. In three there was a definite history of infection through wearing a leper's clothes, one of inoculation in opening an abscess and four through leper playmates, while the hot damp climate favoured the disease and children were most susceptible; in 13 there was clear evidence of commencement of the disease before the age of 12 years, and in many in infancy. The primary lesion was most often on parts exposed to pressure and the bites of insects—all of which is in accordance with the teaching in "Leprosy." Difficulty has been met with in getting the patients to attend regularly for treatment. The writer thinks segregation is necessary to stamp out the disease, but the cost is prohibitive, and cases might be isolated by the chiefs in a house in the villages. Very brief notes of the 100 cases are added.

In a note on the report T. L. CRAIG, S.M.O., advises the consideration of forming a leper camp for 100 to 150 cases with a small dispensary.

L. R.

KÄYSER (J. D.). De vereeniging ter bestrijding der lepra in Nederlandsch-Indië. [**Association for Combating of Leprosy in D.E.I.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 3. pp. 416–426.

The association was founded in 1906 and took care of the home treatment of lepers, if necessary, aided by their voluntary segregation in local asylums. With the assistance of the Government the association maintained centres for combating leprosy at Batavia, Sourabaya, Semarang and Amboina. By winning the confidence of the native lepers it succeeded in getting a good many of them under regular control. In later years the governmental policy of compulsory isolation of the lepers in certain central asylums frightened the patients, induced

them to conceal their disease and interfered with their registration. The author complains of lack of appreciation of the association's work by the Government and thinks that compulsory isolation will do good in the combating of leprosy in the Dutch East Indies.

W. J. Bais.

CAZENAVETTE (L. L.). **Mental Aspect of Leprosy.**—*Jl. Amer. Med. Assoc.* 1927. Oct. 29. Vol. 89. No. 18. pp. 1496–1500. [12 refs.]

The author records his experience as visiting neurologist to the United States Carville National Leprosarium. He found 80 per cent. of 400 lepers to be normal mentally, and only 3 per cent. had definite pyschoses; a larger number showed minor abnormalities, such as mental inferiority and borderland states ; 4 per cent. showed depression, and a few were quarrelsome with delusions of persecution at times. The mental cases were equally divided between the skin and nervet ypes. G. R. MONRAD-KROHN of Norway in a discussion on the above paper concluded that depression is not a direct effect of leprosy or a definite abnormality, and is only indirectly due to the measures taken to isolate the patients, and in Norway he holds that direct leprosy psychoses do not exist.

L. R.

BABONNEIX, TOURAINE & WIDIEZ. Lèpre avec cypho-scoliose. [**Leprosy with Kyphoscoliosis**].—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1927. Dec. 8. Year 43. 3rd Ser. Vol. 51. No. 34. pp. 1575–1578.

The writer describes a case of nerve leprosy complicated by scoliosis from the 4th to the 12th dorsal vertebrae.

L. R.

KLINGMÜLLER (Victor). Ueber tuberkuloide Lepra. [**Tuberculoid Leprosy.**]—*Arch. f. Dermat. u. Syph.* 1927. Oct. 23. Vol. 153. No. 3. pp. 584–589. With 10 text figs. (3 coloured). [Univ. Skin Clinic, Kiel.]

This is a detailed account of two cases of tuberculoid leprosy with illustrations of the microscopical appearances, but it presents no new points.

L. R.

BARGEHR (P.). Abortiv verlaufende Lepraerkrankungen. [**Leprosy with Abortive Course.**]—*Arch. f. Dermat. u. Syph.* 1927. July 4. Vol. 153. No. 2. pp. 295–299. [1 ref.]

The author gives short reports of five cases of undoubted mild leprosy which cleared up in a comparatively short time, and the cures claimed are based not only on the clinical and bacteriological findings, but also the results of cutaneous inoculation of lepromin, or sterilized leproma extracts. Such cases of abortive leprosy are commoner than is generally supposed, and owing to such patients often not seeing a doctor at all their recognition is not easy. Further, abortive leprosy in the sense of the penetration of the lepra bacilli into the body without the occurrence

of any symptoms of the disease is also frequent in persons who have been in close contact with lepers for a long time. Such people may give a positive lepromin reaction, which the author thinks is a sign of existing immunity to leprosy.

L. R.

MUIR (E.). **The Effect of Kala-Azar on Leprosy.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 497–499. [2 refs.]

The author has detected 16 cases of kala azar among the inmates of the Calcutta Leper Asylum, one of whom died of tuberculosis and two of septicaemia. The remaining 13 cases recovered from their kala azar under treatment, and every one of them showed a marked improvement of their leprosy with partial or entire disappearance of the leprous lesions, and the lepra bacilli became granular. In fact the improvement was so striking that other leper patients volunteered for inoculation with kala azar. On the other hand, he has seen early leprosy appear during the latter part of treatment for kala azar after the cessation of fever in five patients. in three of which old disease had been lit up again. He thinks the improvement in the former class is due to fever of kala azar leading to bursting of leper cells setting free the bacilli, with subsequent antitoxin formation and immunity with resulting improvement ; and he explains the latter cases owing to the few lepra bacilli present in the early stages not being sufficient to produce immunity in the same way.

L. R.

MOTTA (Joaquim). Importancia do diagnostico na prophylaxia da lepra—formas atypicas da doença. [**Importance of Diagnosis in Prophylaxis of Leprosy.**]—*Archivos de Hyg.* Rio de Janeiro. 1927. Sept. Vol. 1. No. 2. pp. 103–118. English summary facing p. 119.

In Brazil compulsory notification and isolation of lepers are in force, but nerve cases may be permitted to live at home under good conditions. The value of such prophylaxis depends largely on the ability of the doctors to recognize the disease promptly, which is not always easy, especially in the early stages. Attention is drawn to certain leprosy lesions resembling those of other skin diseases, such as tuberculoids, lupus, annular granulomata, sarcoides, and Sagin [? Bazin] erythema, as well as syphilitic skin lesions and nodular erythema.

L. R.

PALDROCK (A.). **On the Chemistry of the Leprosy Organism. Part IV.** —*Amer. Jl. Trop. Med.* 1927. Nov. Vol. 7. No. 6. pp. 405–408.

Fifteen organisms isolated by various workers from leprosy cases, and believed by them to be the cause of the disease, from Kedrowski to Reenstiera's, have been submitted to staining by methylene blue, methyl green and victoria blue after treatment by different strengths of acids and other powerful chemicals to remove in succession free nucleic acid, bound nucleic acid as nuclear protein, karvonic acid, and

free lipoid and lipoproteins, and in all stages both lepra bacilli from leprous patients and those of the cultures tested gave similar staining reactions ; so the author concludes that these results support the conclusion that these cultures are all those of the bacillus of leprosy.

L. R.

MUIR (E.). **Sodium Hydnocarpate in Leprosy, Suggested Improvements in Administration.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 501–505. With 2 figs. on 1 plate. [1 ref.]

Dr. Muir has investigated the causation of the blocking of the veins following intravenous injections of Rogers' original sodium hydnocarpate, which Muir considers a great advance on insoluble preparations previously used. Sections of obstructed veins shows the presence of considerable proliferation and swelling of the intima narrowing or obliterating the lumen, and leading later to the reduction of the vein to a thin fibrous cord or its complete disappearance. When it is given subcutaneously much pain may be caused. Recently ROGERS has introduced a much less irritating preparation of the sodium salts made from the lower-melting-point fatty acids of hydnocarpus oil, which is painless on subcutaneous injection in a 3 per cent. solution, and can be given intravenously for a long time in a 1 per cent. solution in sufficient doses to produce the desired slight reactions. As larger intravenous doses are advisable in some cases, such as early ones or those nearly cleared up, the difficulty can be overcome by the simple device of using a syringe with double the capacity of the required dose, with a central nozzle, and sucking up into the required dose of 2 to 8 cc. of a 2 per cent. solution about an equal quantity of blood, rotating the syringe on its long axis with the needle in the vein, to mix the blood with the dose, and injecting the whole. Thousands of such injections have never produced clotting or any untoward symptom, and the sodium salts of the whole hydnocarpus oil are also unirritating intravenously or subcutaneously when mixed with blood.

Another way of getting over the difficulty is to make the sodium salts from *H. anthelminica* oil or *H. alpina*, which have less haemolytic power than that from *H. wightiana*. Muir now uses 2 per cent. sodium hydnocarpate intravenously mixed with blood in doses of 2 to 8 cc. following a course of pure hydnocarpus oil subcutaneously. [I have confirmed Dr. MUIR's simple method of avoiding blocking of the veins. Burroughs Wellcome & Co. have now put my new preparation on the market under the name of "Alepol" at an extremely low rate, which allows about 700 doses to be made up from 100 grammes of the powder, and full doses to be given twice a week for a year at a cost of just over 2s. per case or one-twentieth the cost of a good ethyl ester. Very good reports are being received of its use. which is quite painless and very popular with native patients in various parts of the world.*]

L.R.

* A note from Messrs. Burroughs Wellcome & Co. states : "Alepol" is a selected fraction of the sodium salts of the total fatty acids of hydnocarpus oil. The selection of the lower melting point sodium salts . . . obviates to a considerable extent the old disadvantage of vein-blocking, which occurred when these compounds were injected intravenously." "Alepol" is used intravenously and intramuscularly, and is issued in 25-gramme bottles.

LABERNADIE (V.) & LAFFITTE (N.). Traitement de la lèpre par l'huile d'*Hydnocarpus wightiana* (Bl.). (Note préliminaire.) [**Treatment of Leprosy by** *H. wightiana* **Oil.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 710–716. [7 refs.] [Colonial Hosp., Pondicherry, French India.]

After discussing the chaulmoogra oils obtained from different varieties of trees, the authors report the preliminary results of a short trial of Muir's method of subcutaneous injections of pure *H. wightiana* oil with 4 per cent. creosote during three months, given twice a week in doses increased gradually from 2 to cm.; they had no severe reactions and obtained encouraging results, which will be reported on again later. They have introduced the *H. wightiana* trees to Pondicherry, and the oil has the advantage of being very cheap.

L. R.

DE VERA (Bonifacio). **A Brief Report on the Progress of the Treatment Work in the Culion Leper Colony up to March, 1927.**—*Jl. Philippine Islands Med. Assoc.* 1927. Oct. Vol. 7. No. 10. pp. 361–366. [4 refs.]

A total of 3,133 patients were under treatment in the period dealt with, of whom 77 per cent. improved, including 8·4 per cent. who became negative, 11 per cent. were stationary and 11·5 per cent. were worse. During the last five half-yearly periods the results have been very similar, as shown in a table. During the last half year 106 negative cases were added to the 226 remaining at the end of the preceding period, and 52 have been released on parole; 23 per cent. of the remaining 275 have again become positive bacteriologically, most of whom had not been included in the permanent negative list, but a few were true relapses. An analysis is given of the results with various modifications of the injections used. The best results were obtained with iodized chaulmoogra ethyl esters with or without the addition of creosote, but the simple preparations of plain *H. wightiana* oil gave nearly as good results and did not cause induration of the muscles at the site of injections.

In addition to intramuscular injections small doses into the skin lesions appear to produce benefit.

Six metallic preparations were also tried, but four of these completely failed, namely cuproiodase, cuprocyan, tryparsamide and sanocrysin. The gold compounds, krysolgan and triphal, produced slight improvement, but on account of their high price their routine use in leprosy cannot be recommended. Javanin, a pancreatic extract of Dutch origin, injected subcutaneously for five months in three patients produced no effect.

L. R.

EUBANAS (Froilan C.) & DE VERA (Bonifacio). **Notes on the Treatment of Leprosy with Certain Gold Preparations.**—*Jl. Philippine Islands Med. Assoc.* 1927. Sept. Vol. 7. No. 9. pp. 319–323. [6 refs.] [Culion Leper Colony, Philippine Health Service.]

The use of gold preparations in tuberculosis suggested their trial in leprosy, so krysolgan and triphal have been used in five cases each, with two slightly improved and three stationary with the first, and one slightly improved with the latter. Both were given intravenously in

doses of 0·01 gram up to 0·08 gram in 2 cc. of freshly distilled water every ten days for three to four months. No case became worse under the treatment, which was of too short duration to test more than the immediate effects, so further observations will be necessary.

L. R.

PALDROCK (A.). Die CO_2-Schnee- und Solganalbehandlung der Lepra. [**CO_2-Snow and Solganal Treatment in Leprosy.**]—*Arch. f. Schiffs-u. Trop.-Hyg.* 1927. Oct. Vol. 31. No. 10. 459–471. With 6 text figs. [3 refs.]

Solganal is an organic gold preparation (4 sulphomethylamino-2-auromercaptobenzol-1-sulpho-acid-di-sodium compound, $C_7H_6O_6NS_3Na_2Au$). It contains 36·5 per cent. of gold. Four women and three men, who had previously received CO_2 snow treatment, were given solganal in total doses of 11·137 to 13·137 gm., and all showed fever and local reactions in the nodules at irregular intervals, but without material blood changes except increased leucocyte counts in all, especially of the lymphocytes at the expense of the neutrophiles. The quantity of lipase in the blood increased because of the free nucleic acid and gram-positive lipoid acid and lipoproteids liberated from the leprosy bacilli. Solganal is able to attack the granules of the organisms when their envelope has been removed by the previous CO_2 snow treatment, which prepares the way for the action of the gold compound. Moreover, the organism which has ceased to react to the CO_2 snow receives a fresh stimulus from the solganal, which mobilizes so much fresh cellular and blood action that healing is once more started. The author believes that CO_2 snow has an immunizing and solganal a chemotherapeutic action, so both are indicated to supplement each other.

L. R.

MUIR (E.). **The Iodide-Antimony Treatment of Leprosy.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 507–510.

Iodides are regarded by most workers as dangerous in leprosy owing to their producing exacerbations of the disease, but some regard them as useful in diagnosis, especially in facilitating the search for lepra bacilli in the nasal secretions. The author has come to the conclusion that potassium iodide may be useful in wisely regulated dosage by causing breaking down of the leprous tissue, leading to the production of immunity if begun in small doses such as a grain, which may produce a reaction, and gradually increased until 240 grains can be given without any reaction. The signs of reaction are swelling up and redness of existing lesions, the appearance of fresh red nodules, marked acceleration of blood sedimentation, apparent granulation of lepra bacilli in the lesions and sometimes fever. If the new rose-coloured nodules disappear again in a few days the doses may be increased safely. The drug may be used in all stages, and as the leprous tissue clears up the doses may be increased to 20 to 30 grains once or twice a week to cause a rise of temperature of 2 to 4 degrees for one or two days, and when reactions cease the doses are rapidly increased to 180 to 240 grains and continued for some months.

The precautions required are to begin with 1 grain daily, and increase by the same amount each day until slight local or febrile reactions occur, and continue the treatment in the same doses when the

temperature falls to below 99° and local reaction begins to subside, but only once or twice a week, increasing the dose again when no reaction occurs. If a reaction lasts more than three days give 0·02 gram of potassium antimony tartrate in 2 cc. saline intravenously every second day until the reaction has ceased. When the dose reaches 20 grains increase by 5 grains at a time, and when 60 grains is reached increase by 30 at a time up to 120, and when no reactions occur increase up to 240 grains, and continue the 240 grains twice a week for three periods of one month with a rest of one month between each course. The doses should be given dissolved in one or two tumblers of water at bed time, and intermissions should only be made if the patient feels very weak. For painful nerve reactions adrenalin chloride is given intramuscularly. The temperature should be taken at least four times a day to enable the doses to be regulated. The drug may also be used as a diagnostic agent to determine when patients are cured. [Thanks to the kindness of Dr. Muir in sending an early copy of his paper the reviewer has been able to confirm the value of potassium iodide in clearing up the last signs in cases of leprosy nearly cured with the new sodium hydnocarpate, Alepol, and in confirming the cure of cases who had lost all signs of the disease. Dr. Muir's discovery promises to be a most important advance.]

L. R.

STRAITS SETTLEMENTS. **Appendix "A." Leper Asylums. 1.—Leper Asylum, Singapore.** [LINDOW (E. D.).] **Appendix "B." Treatment of Leprosy at Pulau Jerejak.** [WHEATLEY (A. W.).]—*Straits Settlements Med. Rep. for Year 1926.* pp. 69–81. With 29 photographs.

At Singapore there were 37 males and 51 females at the end of 1926. *H. wightiana* oil with 0·5 per cent. iodine was mainly used by injection bi-weekly in doses of 2 to 5 cc. At the Leper Settlement of Pulau Jerejak 681 lepers were under special treatment, 490 of whom were advanced cases. "The lowering of the death rate from 30·68 in 1921 to 13·76 in 1926 shows how beneficial special treatment is in all cases." Here *H. wightiana* oil was also in general use for injections, and advanced cases received Tai Fong Chee orally, consisting of three parts of *H. wightiana* kernels with 1 part of Indian hemp seed in doses of 10 to 30 grains daily. Surgical treatment, mainly removal of necrosed bone and amputation of digits, was of value, and injections of 10 grains of soda salicylas in 3 cc. normal saline intramuscularly gave remarkable relief to neuritic pains; 2 minims of adrenalin hydrochloride in 20 minims saline subcutaneously is useful for leprotic fever. Sodium morrhuate and sodium soyate was used in 20 cases with 1 cleared up and 8 improved. The Tai Fong Chee treatment in 345 cases showed 229 improved, but none markedly so or cleared up. Details of 8 cases cleared up are given.

L. R.

COCHRANE (Robert G.). **Leprosy—Symptoms, Diagnosis and Treatment.**—23 pp. The Mission to Lepers, 33 Henrietta Street, London, W.C.2.

This little pamphlet gives a very useful brief account of the subject, suitable for helping those in charge of lepers, and includes prognosis.

The treatment recommended is on the lines of Dr. MUIR of Calcutta by hydnocarpus oil or ethyl esters. It was apparently written before the reintroduction of the painless and cheap hydnocarpates now known as Alepol.

L. R.

ITURBE (P. M.). La sedimentacion globular en el estado patologico: sedimentación globular en la lepra. [**The Rate of Sedimentation of Red Blood-Corpuscles in Leprosy.**]—*Gac. Med. de Caracas.* 1927. Jan. 15. Vol. 34. No. 1. pp. 7–13.

The author has estimated the velocity of corpuscular sedimentation in various morbid conditions and here records his results in the different types and stages of leprosy. The method employed is that of WESTERGREEN. The blood was taken between 10 a.m. and noon, citrated and placed in the tubes up to a definite mark and the rate of sedimentation in millimetres was noted at the end of 1, 2, and 24 hours. 110 cases were examined, 70 of whom were males. Generally speaking, the rapidity of sedimentation was greater in women than in men, but in no instance was the rate the same as occurs in normal subjects.

As regards the type of disease: in the actively nodular forms or the mixed in which the nodular predominated, the rapidity was very marked, in some as much as 100 mm. in the first hour; in the nervous form it was much less and in cases with mutilation it varied between 40 and 76 mm. The clinical state considerably influenced the rate. The blood of patients with attacks of fever and abundant lepromata in full development yielded the highest degree of rapidity, as much as 100–150 mm. in the hour, and higher during the febrile period than when the temperature had fallen. Only in those residing in the leprosarium who were apparently healthy and in whom bacteriological examination was negative did the rate approach anything like normal.

Finally, the effect of treatment. When chaulmoogra is first begun the rate is increased, perhaps owing to a reactivation of infection. The corpuscles of those who had been for a long time under treatment and whose condition was clinically improving, sedimented at a lower rate and, vice versâ, if the conditions were becoming worse the rate increased.

The test is likely to be of service, therefore, in cases of suspected leprosy, since a normal sedimentation-rate excludes leprosy and even in patients without clinical symptoms and negative bacteriologically the author never saw a fall of less than 7 mm. in the first hour.

H. Harold Scott.

ARQUIVOS INDO-PORTUGUESES DE MEDICINA E HISTORIA NATURAL. Nova Goa. 1927. Vol. 4. 326 pp. [**Leprosy in Portuguese India.**]

This publication comprises six separate articles. The first deals with the history of leprosy in Portuguese India; the second consists of records of over 100 cases to form a basis for statistics; the next two are devoted to Chaulmoogra and other plants which may be used for treating the disease; the fifth presents various suggested prophylactic measures; the last is a report of the proceedings of the Leprosy Conference.

The historical account, though brief, is interesting. The disease has existed for a long time and has probably increased during recent years, but definite proof of this is wanting, seeing that statistics are not reliable. In February, 1916, Professor CORREA estimated that there were 100 lepers in

Gôa and suggested the establishment of a leprosarium on the island of Acarô. Matters move slowly in these districts. Eighteen months later the question was debated and in March, 1921, several sites were considered and the island first proposed was selected as the most suitable. The measures of the Government were assisted by charitable institutions, the Asylum of Mapuçá and the Hospice of Margão.

The second contribution is divided into four sections. In the first are brief records of 110 typical cases; in the second *formes frustes* and latent cases are spoken of, also with records, though of the briefest, merely a line or two to each; in the third are similar notes on 52 patients coming from places outside Gôa itself, the fourth giving the family-histories of a few of these. Such an investigation was needed before any purposive prophylactic measures could be formulated and taken in hand and they serve to show that the diagnosis of infection is not always a simple matter, and further, that the social problem of the way in which relatives and contacts should be dealt with is also by no means easy of solution.

In the third paper, *Gynocardia odorata* is stated to be the source whence the chaulmoogra oil is obtained. The chaulmoogra (falsely so called) of China is made from *Hydnocarpus anthelmintica*. In Gôa there are three species of Hydnocarpus, namely, *H. wightiana*, *H. anthelmintica*, and a third at present unidentified. Also useful in leprosy, according to the author, GRACIAS, are: (1) *Calotropis gigantea* (the "Flora sagrada of India") of which the bark, the flowers, and the viscid juice are employed; the dose is 3–10 gm. (2) *Hydrocotyle asiatica*, one of the Umbelliferae, from which a fluid extract is prepared and given in doses of 1–5 drops; larger doses are toxic. An unguent is made for external use and is said to give excellent results in elephantiasis and leprosy; it contains 1 part of the extract to 8 of lanolin. Other plants are mentioned, but the reported benefits resulting from their use in leprosy need further experimental work and clinical confirmation.

The problem of prophylaxis is based on the following main indications: (1) Compulsory notification; (2) isolation of severe cases; (3) treatment in hospitals or dispensaries; (4) domiciliary isolation by permission in special cases; (5) early removal of children from a leprous environment; (6) careful supervision of all those living in the near neighbourhood of sufferers; (7) intensive educational propaganda.

The concluding section, the report of the Conference, is largely a summary of the preceding papers which have been printed *in extenso* in the previous parts of the book.

H. Harold Scott.

MUIR (E.), HENDERSON (J. M.) & LANDEMAN (E.). **Tumour-Like Growths caused by Intraperitoneal Inoculation of** *B. leprae murium*. —*Indian Jl. Med. Res.* 1927. July. Vol. 15. No. 1. pp. 15–19. With 5 plates (4 coloured).

The resemblance of the organism of rat leprosy to that of the human disease, and the fact that the former can be easily inoculated from one rat to another makes its study of interest. The authors found that all the rats which survived subcutaneous or intraperitoneal injections developed signs of rat leprosy within four or five months, but the latter method of injection produced much grosser lesions, including intra-abdominal tumours in five out of seven animals, which weighed up to 20 gm. and affected any part of the peritoneum. They were characterized by an external organized layer lined by a thick caseous layer with liquefaction in the centre. On microscopical examination the outer layer contained numerous large cells crammed with lepra bacilli, which they think are derived from the peritoneal endothelial cells, for the bacilli

were also found in those of the peritoneal layer over the kidneys. The liver also shows enormous masses of leprosy bacilli with a tendency to soften in the centre. All the growths appear to be granulomatous in nature. The naked eye and microscopical lesions are illustrated by good plates.

L. R.

LITTLE (E. Graham) & HASSON (James). In England entstandener und mittele der Impfbehandlung geheilter akuter knotiger Aussatz. [**Acute Nodular Leprosy arising in England and cured by Inoculation Treatment.**]—*Wien. Klin. Woch.* 1927. Oct. 20. Vol. 40. No. 42. pp. 1319–1321. With 3 text figs.

This is the same case as that reported in the *British Medical Journal* a year ago, and reviewed, together with criticisms of the conclusions come to in this *Bulletin*, Vol. 24, No. 3, p. 212.

DE ALMEIDA (Theophilo). O papel da educação sanitaria na prophylaxia da lepra. (Trabalho apresentado ao 3o Congresso Brasileiro de Hygiene).—*Archivos de Hyg.* Rio de Janeiro. 1927. May. Vol. 1. No. 1. pp. 175–185.

ARAUJO (Oscar da Silva). A prophylaxia da lepra e das doenças venereas no Brasil e a actuação do departamento nacional de saude publica.—*Archivos de Hyg.* Rio de Janeiro. 1927. Sept. Vol. 1. No. 2. pp. 195–253. With 40 figs. (1 map) on 29 plates.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

James (W. M.). **Remarks on the Diagnosis of Intestinal Amoebiasis.**—*Fifteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1926. pp. 82–88. [11 refs.] Also in *Jl. Amer. Med. Assoc.* 1927. Oct. 29. Vol. 89. No. 18. pp. 1469–1472. [11 refs.] [Herrick Clinic, Panama, R.P.]

A worker in areas where *Entamoeba histolytica* infection is common, who wishes to diagnose correctly and treat the many varieties of "stomach trouble" which constantly present themselves, must be prepared to recognize amoebae in the stools and to differentiate *E. histolytica* from the three other amoebas often found, and often associated with it in the same stool—viz., *E. coli*, *Iodamoeba bütschlii*, and *E. nana*.

In this paper Dr. James' theme—insistent, clear and convincing—is that the correct diagnosis of histolytica infection is not a mere routine laboratory procedure, but one requiring training, patience, and a reasonable degree of skill. None has greater claims than he to be listened to on this subject; and it is significant that in 1927 he is to be found urging that it is not a problem of the trouble it takes, but one of correct diagnosis of a common and often chronic disease of the large intestine with protean symptomatology, and endorsing Dobell's (1919) dictum that if it cannot be made properly it should not be made at all.

Survey figures, for the most part based on examinations of old stools and not checked, as a rule, by search in permanent preparations, show that one examination uncovers about one-third of the actual number of histolytica infections present in a community; three examinations between one-half and two-thirds; and six examinations up to about 90 per cent.; an indefinite number of examinations may be required before the remaining 10 per cent. of infection is found.

The author states that his own figures to date show that in about one-half of his histolytica infections, excluding acute dysentery, only vegetative forms are found at any one examination, and these would have been lost in survey work. By using reasonably fresh material, and *by the study of permanent preparations made from this*—and it must ever be borne in mind that the smears cannot be allowed even the slightest touch of drying or the nuclei of the amoebae become distorted and broken up—he believes that in trained hands the percentage of positive observations in amoebiasis (not amoebic dysentery) can be raised on first examination to 75 per cent. The second examination, when the first has been negative, brings this up to 90 per cent. The figures are based on his own experience. Up to date in the study of permanent preparations from 250 patients, if the third examination had not disclosed a histolytica infection he has not found it in the fourth, fifth, sixth, or seventh examinations except very rarely. Moreover in a series of control smears from apparently normal patients, when the smears were negative in the first three examinations he had not found *E. histolytica* or other amoebas subsequently.

The variation in the number of amoebas, in both histolytica and other species' infections, from day to day is remarkable. In a given case on

one day amoebas are very numerous and easily found—on another day only prolonged search in permanent preparations will reveal them and the fresh specimen will often be entirely negative.

Both for finding amoebas and for their differentiation examination of permanent stained smears is therefore obligatory. Their preparation takes time, but is no more difficult than other routine histological and pathological work.

Dr. James has instituted an interesting control. In 1924 he made permanent preparations from a series of stools with positive protozoological results and sent them to various recognized authorities—with intent to find out whether such authorities would be in substantial agreement and also to check his own interpretation. Fifty slides from forty cases were sent, and data were received from WENYON; HEGNER & BAUER; ST. JOHN; SCHULE; and HAUGHWOUT. (All of the results, including his own in the fresh preparations, will be sent to WENYON for correlation). Up to date, taking observations in permanent preparations as criteria, *his percentage of error in the examination of fresh specimens, with especial reference to occurrence of* E. histolytica, *was too high for accurate clinical work.* There was however substantial agreement among all as to the finding of *E. histolytica* in the permanent preparations.

In perfectly fresh stools, the thoroughly trained and competent protozoologist can, as DOBELL (1919) stated, differentiate accurately between the five species of the intestinal amoebas of man. These specific conditions do not obtain for clinical and laboratory work in the tropics except, as yet, very rarely. To get suitable stool material KOFOID advocates use of bile salts or ox gall—and this does give good results. The author has found a mild laxative will serve in most cases. A soft stool, without purgation, is required. It is very difficult to make permanent preparations from liquid stools and a stool that contains material from high up in the bowel as well as from lower down is best. The largest numbers of amoebas are most often found after a mild laxative following one or two days of constipation.

The author concludes by describing the wet fixation of smears in Schaudinn's fluid and a method, devised by KOFOID, of preserving and packing the slides in alcohol for transportation.

H. M. Hanschell.

MUSSER (J. H.). **Amebiasis.**—*Amer. Jl. Med. Sci.* 1927. July. Vol. 174. No. 1. pp. 1–8. [2 refs.] [Tulane Univ. of Louisiana & Charity Hosp., New Orleans.]

An interesting analysis of intestinal amoebiasis as seen in the Charity Hospital, New Orleans, during 1925. In that year 72 patients, from a total of over 25,000 admissions, were diagnosed as suffering from amoebic dysentery. In 21 of these amoebiasis was doubtful. In the 51 cases definitely diagnosed as amoebic dysentery one patient was 19, and one 15 years old; 12 patients were between 21 and 30 years, 23 between 31 and 40 years, 9 between 41 and 50 years, 2 between 51 and 60 years. and 2 over 60 years. The disease thus appeared commonest between 31 and 40 years, very rare under 18 years, and "a clinical curiosity in a child." Of the 51, 46 were males and 5 females, and as would be expected in a Charity Hospital, all came from the lower walks of life. Only 14 were negroes. This is of moment, for the negroes' hygiene, or

rather lack of such, is decidedly more faulty than the white man's. Some racial immunity is indicated. [But does the negro of New Orleans seek hospital aid so readily as the white man ?]

Symptoms of onset. In 40 cases the complaint was diarrhoea. One case came because of increasing weakness, seven were admitted because of loss of weight, two because of rectal pain, and one because he thought he had bleeding haemorrhoids. Thirteen patients complained of abdominal cramps rather than of the accompanying diarrhoea.

Duration. Varied from 2 weeks to 30 years. In patients with symptoms severe enough to classify as dysentery, duration was up to one month. A history of diarrhoea for three, four, eight, ten, twelve years was common, and one case thirty years.

Repetition of attacks. One patient had his second attack 15 years after the first. Another in 15 years had 3 attacks. Another in 12 years had an attack every year for 4 years, in the other 8 years a mild diarrhoea about once a month. One man in 3 years had 10 attacks of diarrhoea lasting for one week. Another in 7 years had 15 attacks of diarrhoea and cramps.

Physical examination. In 21 cases tenderness and rigidity of abdominal wall. In 5 cases distension of abdomen, and in 5 cases enlargement of liver.

Proctoscopy in every one of the 51 cases revealed congestion of mucous membrane and ulcers covered with bloody mucus containing many amoebae.

Treatment. Yatren was apparently most successful ; it was used in 24 cases, stovarsol in 7 cases, emetine and ipecac, alone and in combination with stovarsol, in the other cases. Emetine in 3 cases was followed by relapse. The author adopts the classification of Low and Dobell : (1) carrier ; (2) general amoebiasis ; (3) amoebic diarrhoea ; (4) amoebic dsyentery ; and discusses briefly each category. One may note that he quotes a personal communication of Johns that fresh duodenal contents have no effect on the cyst wall and that liberation of the encysted protozoa is probably through a process of autodigestion of the cyst wall under favourable circumstances. It is estimated that one in 20 who have amoebic diarrhoea or dysentery develops hepatic abscess. Classical symptoms of amoebic dysentery are so typical that a presumptive diagnosis may be made solely on the recital of the patient's story. Frequent stools, marked tenesmus, cramps, ineffectual desire to defaecate at frequent intervals. Stools contain little faecal matter, often nothing but blood and mucus, and amoebae in enormous numbers. The patient wastes very quickly. From the epidemiological standpoint the patient with acute amoebic dysentery, passing only vegetative forms of amoebae in his stools, is of no danger to his fellow man.

H. M. H.

Dunn (T. B.). **Amoebiasis.**—*China Med. Jl.* 1927. July. Vol. 41. No. 7. pp. 607–620.

A long paper, interesting, and clearly written, covering in detail practically the whole field of amoebiasis, and concluding with description of clinical cases and the author's own experiences in their diagnosis and treatment. No new ground is broken. It is worthy of note that he has found the chronic amoebiasis case to do well, not on restricted dieting, but on a diet rich in vitamins.

H. M. H.

COLE (J. C.). **Amebic Disease.**—*New Orleans Med. & Surg. Jl.* 1927. Aug. Vol. 80. No. 2. pp. 81–84. [6 refs.]

An interesting though general review of the subject. The author states that unless one is familiar with the pathology of amoebic disease he cannot appreciate the difficulties sometimes experienced in getting a permanent cure through any one system of treatment. The line of attack must be directed toward amoebae in the tissues and those in the lumen of the gut. Emetine, stovarsol, and yatren have proven almost magical in controlling the active symptoms of amoebic infections. Periodic courses of these drugs should be given for at least one year. The healthy carrier should be treated in the same manner as the convalescent from the acute condition. Amoebic disease is not purely topical, but general and widespread. The term amoebic dysentery has dragged into disrepute the more dignified term amoebic disease, since the true dysenteric case is probably in the minority.

H. M. H.

GEHRCKE (Adolf). Die Amöbenerkrankungen des Menschen, insbesondere der Affektion des Intestinaltraktus und ihrer Komplikationen. Eine Studie in klinischer, ätiologischer und therapeutischer Hinsicht im tropischen Britisch- und Holländisch-Indien. [**Amoebiasis of Man especially Intestinal.**]—*Med. Klin.* 1927. Apr. 29 & May 6. Vol. 23. Nos. 17 (1168) & 18 (1169). pp. 637–640 ; 679–681.

——. Die Therapie der Amöbenerkrankungen des Menschen, insbesondere der Affektion des Intestinaltraktus und ihrer Komplikationen. Eine Studie in klinischer, ätiologischer und therapeutischer Hinsicht im tropischen Britisch- und Holländisch-Indien.—*Ibid.* May 20 & 27. Nos. 20 (1171) & 21 (1172). pp. 756–759 ; 795–798.

The author points out that whereas in the tropics malaria is a danger only in certain localities, amoebiasis is found everywhere, and ranks hardly below malaria as a cause of invalidism. In these papers human amoebiasis, especially that of the intestinal tract, is described and reviewed carefully and in detail under the headings—Primary localization of the amoeba ; Incubation ; Toxicity of the amoeba ; Metastases ; Purely toxic complications ; Chronic intestinal amoebiasis ; Ileocaecal lesions and appendicitis ; Lesions of rectum ; Causes of exacerbation and relapse of intestinal amoebiasis ; Encystment of amoebae and its significance.

Treatment is fully dealt with under—Control of treatment by stool examination ; emetine ; yatren as " specific " for amoebiasis ; stovarsol and allied arsenicals ; dieting. Finally there is an interesting discussion of the relation of chronic intestinal amoebiasis to sprue, the dietary treatment of sprue, and the bearing of climate on these ailments. These papers contain what has been oft recorded, and so well known probably to most tropical practitioners. They constitute a thorough exposition of the subject of intestinal amoebiasis and a valuable guide to the clinician who must deal with the disease.

H. M. H.

BRUMPT (E.). Pluralité des amibes intestinales humaines à kystes à quatre noyaux. [**Plurality of Quadrinucleate Cysts of Intestinal Amoebae in Man.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 835–860. [Also issued as *3a Reunión, Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 727–752.]

A critical review—interesting though (necessarily) long. The author concludes that :—

(1) Man can harbour in his alimentary canal three species of amoeba having quadrinucleate cysts. These are, in order of frequency, *Entamoeba dispar, E. Hartmanni* and *E. dysenteriae* [*histolytica*].

(2) *Dispar* has cysts 10–16μ, exactly like those of *histolytica.* Injected intrarectally, and anus then sealed, into kittens, *histolytica* kills the kitten, and characteristic lesions are found in its gut : *dispar* on the contrary, even if producing a heavy infestation, infects the kitten but for a short time, and produces no lesions in the gut, the walls of which do not become thickened.

(3) In every country where amoebic dysentery and liver abscess is autochthonous, or imported, the haematophagous *histolytica* is identically pathogenic for man and kitten.

(4) *Histolytica* sets up, in 10 to 20 per cent. of cases, dysentery ; in others various intestinal troubles ; quite healthy carriers are rare.

(5) *Dispar* and *Hartmanni*, when very numerous, cause various slight digestive disturbances in man. There are healthy carriers of both, with normal stools.

(6) Numerous small epidemics in temperate climates demonstrate that change of climate brings about no change in virulence of the true dysentery amoeba.

(7) No one has shown that the cysts of the dysentery-amoeba lose their virulence in carriers who have long dwelt in cold countries ; the author has shown by direct experiment that virulence is in fact maintained in such carriers.

(8) The author recommends, besides statistical research, direct experimental infection of kittens with the cysts from carriers in countries where autochthonous amoebic dysentery is rare—in order to discover the frequency of *E. dispar* infection.

H. M. H.

FEDER (J. M.). **Intestinal Amebiasis from the Pathologist's Standpoint as related to the Clinical Picture.**—*Jl. Lab. & Clin. Med.* 1927. Feb. Vol. 12. No. 5. pp. 451–454.

The clinical pathologist's contribution by expert examination of faeces is necessary for accurate diagnosis of amoebiasis and for control of treatment. His part too is the detection of the carrier case. Hitherto a large percentage of infected cases has been missed by faulty technique in examination of stools. The author stresses the necessity for wet fixation and staining of specimens, and for the examination of several specimens. [Culture is not mentioned.] Improved sanitation, e.g., in Canal Zone, has been responsible for a sharp decline in the number of cases of amoebiasis. Intestinal amoebiasis is not a

tropical so much as a cosmopolitan disease. It is not necessarily accompanied by dysentery, and the vague case sans dysentery requires the most skilful stool examination.

Carriers constitute a vital factor in its spread. Amoebiasis is an extremely protean disease and every case of vague gastro-intestinal upset must be suspected of and examined for amoebiasis.

H. M. H.

TIXIER (L.), FAVRE (M.), MORENAS (E.) & PETOURAUD (Ch.). Amibe dysentérique et ulcerations cutanées. Etude histologique, parasitologique et clinique. Contribution au diagnostic des ulcérations cutanées chroniques. [**The Amoeba of Dysentery and Ulcerations of the Skin.**]—*Ann. Dermat. et Syph.* 1927. Oct. 6th Ser. Vol. 8. No. 10. pp. 521–538. With 7 figs. [Hôtel-Dieu, Bact. Inst., Lyons.]

The authors are to be congratulated on this very thorough and interesting study of a rare skin lesion. Mercifully, they have spared us those slovenly annoyances—histological micro-photographs; on the contrary, they earn our thanks for embellishing their text with illustrations that do illustrate the microscopic anatomy of the lesions and the presence therein of amoebae, and really enhance the value of this contribution to dermatology.

Surface lesions of the skin caused by the dysentery amoeba have been hitherto rare. The literature contains very few records of it. It is known that there occurs sometimes ulceration of the skin of the abdominal wall around the opening on to the surface of a liver abscess. Extra-abdominal skin lesions due to amoebic infection are extremely rare.

The author's case was that of a peri-anal lesion in a patient suffering from chronic dysentery. The peri-anal ulceration had been present, slowly extending, for 6 years. It had resisted various medications and recurred after two surgical operations. The lesion, however, healed rapidly—in a few days—after emetine injections. In the pus from the ulcers many typical dysentery amoebae were found. The microscopical study of the lesions brought out two features (shown in the text figures). (1) The presence of microscopic punched-out ulcers in the epidermis, distinct from the large amoebic ulcers. For this sharply circumscribed entirely-microscopic ulcer, rich in amoebae, the name *Porodermie amibienne* is proposed. (2) The presence of colonies of amoebae deep down in the dermis, away from the surface ulceration.

The authors state that diagnosis of amoebic ulceration of skin cannot be made on the microscopic characters alone; the clinical history of the patient and especially the results of laboratory investigation are necessary. They think it probable that systematic search for amoebae in the pus of skin ulcerations of obscure aetiology will show that cutaneous amoebiasis more frequently occurs than is at present admitted. The interest in establishing the fact of amoebic ulceration of the skin is twofold—that of exact diagnosis, and that of bringing into play a therapy, rapid and complete.

H. M. H.

WRIGHT (Henry W. S.). **Extra Hepatic Surgical Amoebiasis.**—*China Med. Jl.* 1927. May. Vol. 41. No. 5. pp. 438–449. [5 refs.]

Besides hepatitis, and ulcerative colitis, which may go on to abscess formation, there are other conditions directly or indirectly caused by the *Entamoeba histolytica*, coming within the purview of the surgeon, which may require operative treatment.

(1) Infiltration of the wall of the gut secondary to amoebic ulceration. This infiltration may be so massive as to simulate tumour formation, and may also give rise to stricture.

(2) Chronic or subacture appendicitis as a sequel to amoebic infection of gut. In these cases motile or encysted amoebae are present in the stools.

(3) Perforation of amoebic ulcer. Peritonitis occurs also from infection through needle track, or rupture of liver abscess; or from slow pyogenic infection coming through thin but apparently intact base of an amoebic ulcer.

(4) Amoebiasis cutis—connected with sinus running down to liver, or around caecostomy wounds.

(5) Amoebic fever—slight fever and leucocytosis over a long period of time. Examination reveals amoebae or cysts in the stools and recovery follows on emetine treatment.

(6) Nephritis and cystitis—amoebae are found in the urine and the cases respond to specific therapy.

(7) Splenic abscess and gall bladder infection.

(8) Metastatic abscesses in lungs, brain and in the subcutaneous tissues.

(9) Irido-cyclitis—in patients the subject of chronic amoebic colitis, and supposed to be due to the toxins from the amoebae. In the early stage emetine cures the condition.

The author does not claim to have had personal experience of all of this extra-hepatic amoebiasis; but points out that in China, where amoebic dysentery is so common, a look-out should be kept for these obscure cases.

H. M. H.

FOSTER (J. H.) & FARNAM (W.). **Fever in Amoebiasis.**—*China Med. Jl.* 1927. July. Vol. 41. No. 7. pp. 621–626. [2 refs.] [Hunan-Yale Hosp., Changsha.]

The authors in an interesting paper describe three cases in Europeans; in all fever was the cardinal symptom. In addition all had more or less colitis. In the stools of all amoebae or amoebic cysts were found, after many negative searches. In one of the cases there was involvement of the liver; this case eventually reacted well to emetine treatment, as did the other two.

The authors have not noted, as yet, this "amoebic" fever in any of the numerous cases of amoebiasis in their Chinese patients. They note that the occurrence of a persistent low fever without any definite physical signs in foreigners in China leads many physicians to suspect pulmonary tuberculosis. The three cases here cited emphasize the importance of ruling out amoebiasis before making a diagnosis of tuberculosis.

H. M. H.

D'AMATO (Hugo J.). Entameba histolítica en el líquido duodenal. [*Entamoeba histolytica* **in the Duodenal Contents.**]—*Semana Méd.* 1927. June 30. Vol. 34. No. 26 (1746). pp. 1557–1563. [16 refs.] [" Instituto Modelo " Clin. Med., Buenos Aires.]

A married woman, 20 years of age, complained of pain in the right hypochondrium and umbilical regions. One year previously she had had an attack of jaundice with choluria. Nineteen days before coming under observation for the present illness she had a definite attack of biliary colic; there was acholia with choluria, but no jaundice. In the faeces were cystic forms of *E. histolytica* and both vegetative and cystic forms were seen in the fluid removed by the duodenal sound. There was anaemia, red cells 3½ million, haemoglobin 90 per cent., leucocytes " normal," 40 per cent. lymphocytes.

In the author's opinion, though the commonest route by which the amoeba reaches the liver is by the blood-stream, in the present case they ascended the intestinal tract; in the first attack the result had been " hepatogenous " jaundice with choluria, but not acholia, while in the second by ascending the duodenum the amoebae had set up a catarrhal angiocholitis, obstruction of the ducts and acholia with choluria but no jaundice, partly because of the efficient renal function and partly because of the brevity of the attack.

H. Harold Scott.

RAÚL GOYENA (Juan). Cancer del recto y amibiasis. [**Rectal Carcinoma and Amoebic Infection.**]—*Semana Méd.* 1927. Sept. 1. Vol. 34. No. 35 (1755). pp. 542–547. With 2 text figs. [16 refs.] [" Modelo " Inst. of Clin. Med. Buenos Aires.]

The author records the case of a man of 47, who suffered from diarrhoea, 6–14 stools daily, semiliquid, and at times containing pus and blood.

Entamoeba histolytica in cystic and precystic forms was found, but the condition did not clear up on the usual lines of treatment. Rectoscopy revealed a tumour with a little ulceration, and histological examination proved it to be adenocarcinoma. The inferences drawn are three: (1) That faecal examination should be carried out in all patients with symptoms referable to the lower bowel; (2) that, even if amoebae are found, rectoscopic examination should also be made; (3) that if a tumour is present, a portion should be submitted to histological investigation. [Practitioners cannot fail to agree with all of these.]

H. Harold Scott.

i. FOWLER (Henry P.). **Report on a Case of Liver Abscess.**—*West African Med. Jl.* Lagos. 1927. Oct. Vol. 1. No. 2. p. 20.

ii. GLOVER (W. E.). **Hepatic Abscess in an African.**—*Ibid.* July. Vol. 1. No. 1. p. 10.

iii. MCCULLOCH (W. E.). **Amoebic Abscess of the Liver cured by Emetine Injections.**—*Ibid.* pp. 10–11.

i. A native aged 45–50 years—eights months wasting, fever, sweating—for five months progressive enlargement of abdomen; dysentery 17 years previously. A large fluctuating tumour in upper abdomen extending downward to pelvis. Abdomen opened and " many pints " of anchovy-paste-like pus evacuated from " cystic " tumour in liver. Collapse and death 3 days later.

ii. Native policeman. Irregular fever, sweats, enlarged tender liver. Injections of emetine for 7 days procured no improvement. On 7th day exploratory needling revealed pus in liver. Abscess drained by open incision—two pints thick pus. Uneventful recovery. No amoebae had been found in pus or in stools.

iii. Native 55 years old—severe pain in epigastrium, great tenderness to palpation to left of middle line. Liver edge half an inch below costal margin and dulness upwards to left nipple. No tumour to be felt. No fever; pulse 92 per min. Later, fever developed and a tumour orange-sized appeared in left lateral vertical and transpyloric plane. Emetine gr. 1. injected. Exploratory needle drew off 16 cc. anchovy pus. In all 20 grs. emetine given. Uneventful recovery. No history of dysentery. Amoebae had been found in stools but none in the pus.

H. M. H.

MANSON-BAHR (Philip) & SAYERS (E. G.). **Recent Advances in the Treatment of Amoebic Dysentery together with an Account of the Sigmoidoscopic Appearances observed in Different Stages of the Disease.**—*Brit. Med. Jl.* 1927. Sept. 17. pp. 490–492. [4 refs.]

A résumé of treatment with accounts of illustrative cases. Emetine is still treatment of election in early stages of acute amoebic dysentery and for amoebic hepatitis. Some cases relapse and further treatment with emetine is often of no avail; the amoebae have become emetine-resisting. Chronic cases often do not respond well to emetine treatment. Many of the emetine failures were cured by emetine-bismuth-iodide. Of 40 cases treated with E.B.I. alone, 5 were not cured after full courses of E.B.I. and emetine periodide. The more acute the symptoms the more striking and permanent had been the effects of E.B.I. treatment. Emetine periodide has proved less satisfactory—out of 12 cases treated with it, 5 had to be treated later with E.B.I. to obtain permanent cure. Three patients relapsed after 9 courses of treatment with E.B.I.—entamoebae become resistant to this drug also. Though E.B.I. has procured an increased number of permanently cured amoebic dysenteries, there still remain many who, in spite of all known treatment, will eventually relapse. Such patients usually become neurasthenic. Emetine entails rather painful injection; and E.B.I. notoriously is likely to cause vomiting. A graver objection is the toxic effect of emetine—fall in blood pressure, cardiac irregularity, neuritis, desquamation of skin, mental depression—counteracted somewhat by more generous diet.

Yatren 105 can be given orally, rectally, intramuscularly, or intravenously. The usual dose by mouth, 15 grains thrice daily, causes diarrhoea; pills or cachets containing 4 to 8 grains thrice daily prove satisfactory. After cleansing rectum with 2 per cent. sodium carbonate enema, yatren 200 cc. $2\frac{1}{2}$ per cent. solution is slowly run in and retained by patient for as long as possible. Patients learn to hold it for 8 hours or longer, proof of absorption being in testing urine with perchloride of iron; yatren produces a greenish colour. Yatren is given for 10 days by mouth with ten daily injections per rectum. After 5 to 7 days this course is repeated. Milk diet alone is quite unnecessary. No toxic symptoms have been observed by the authors or reported in the literature. It is claimed that yatren is a definite cell-stimulant. VOGEL has shown that yatren in dilution 1–100 kills all the *E. histolytica* in culture in 3 hours, and in 1–1000 prevents multiplication after 12 hours. The authors can fully confirm the efficacy of yatren in curing long-standing amoebic dysentery which has proved resistant to emetine and E.B.I. Several cases of amoebic hepatitis apparently cured by yatren have been recorded.

Yatren appears to be curative when lesions are in lower portion of large intestine, but patients sometimes relapse because of lesions in caecum and transverse colon. To meet this, the authors introduced what they believe to be treatment of election for resistant cases of amoebic dysentery—*viz., E.B.I. by mouth combined with yatren per rectum.* During 1926 this combined treatment was given to 22 cases, 3 grs. E.B.I. every night, and 200 cc. 2½ per cent. yatren solution in lavages per rectum, in the morning. It is well tolerated, vomiting is almost entirely absent and the usual E.B.I.-diarrhoea not observed. Out of a series of 153 proved amoebic dysenteries, these cases have been the most successful, especially if it is noted that most of the 22 were long-standing "intractable" cases. The authors discuss briefly the probable action of these drugs in combination treatment. Among other points continuous treatment day and night gives the parasite no chance to recuperate. Whatever the rationale of the treatment may be, the combined drugs are remarkably well tolerated, and results controlled by sigmoidoscope and backed up by clinical observations, have been very satisfactory.

H. M. H.

WALDORP (Carlos P.). Nuestro tratamiento de la amebíasis intestinal con píldoras queratinizadas y grafitadas de yatrén y emetina. [**Intestinal Amebiasis treated by Yatren and Emetine.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 226–231. [Also issued as *3a Reunión, Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 118–123.]

The author confirms the good results recorded from the use of yatren in amoebic dysentery. The employment of this *per os* in pill-form together with emetine subcutaneously sometimes gave even better results. He then gave the combination as pills in the following doses: 2 pills on the first day, 3 on the second, 4 daily for the next three days, 6 on the next two. If well tolerated, up to 8 might be given on the ninth and tenth days; if badly borne, only six. Each pill was of 20 cgm., and 46–48 were taken in 10 days. In every 10 gm. of the pill-mass there were 8·5 gm. yatren and 1·5 gm. emetine. A record of nine patients is presented in a table; in one there was early vomiting, and in one other nausea; with these exceptions the pills were well tolerated and the results are reported as being better than with either drug separately.

H. Harold Scott.

VAN STEENIS (P. B.). De behandeling van amoebendysenterie met emetine, yatren en stovarsol. [**Treatment of Amoebic Dysentery by Emetine, Yatren and Stovarsol.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 3. pp. 347–357. [11 refs.] [Military Med. Lab., Weltevreden, Java.]

Emetine hydrochloride in hypodermic injections is still indispensable in the treatment of amoebic dysentery because of its sterilizing influence in the tissues against the histolytic type of the amoeba, and consequent preventive action against metastatic abscesses. Dose; 30–60 mgm. daily, on 5 consecutive days, not more than once per month.

Yatren acts on the intestinal infestation, no matter whether histolytic or minuta type of the amoeba, or both, be present. It has no toxic by-effect or cumulative action, and its administration can therefore be repeated deliberately. Dose; 3 gm. daily, during a week; with 3–7 days rest between the separate courses. Diarrhoea caused by yatren, though harmless, is sometimes annoying.

Stovarsol is less effective against the histolytica type than emetine or yatren, but is very useful against the minuta stage of the amoeba. Dose; 250 mgm. 3 times daily, during 1 week, continued in diminishing doses for about two months afterwards. No toxic effects were noted.

W. J. Bais.

HOUSSIAU & DUWEZ (J.). De l'ipéca et succédanés dans l'amibiase intestinale. [**Ipecacuanha and its Substitutes in Intestinal Amoebiasis.**]—*Bruxelles-Méd.* 1927. July 10. Vol. 7. No. 37. pp. 1138–1147. [Numerous refs.]

This paper is a general, yet rather brief review, of the whole matter of the treatment of intestinal amoebiasis. The authors conclude that:

1. Emetine singly is a sufficient and effective cure for amoebic dysentery if given from the first onset of the disease.
2. It has little or no effect on cysts. If these be present, and in relapses, treatment should be by emetine + stovarsol, or yatren + emetine.
3. In patients with heart disease, enfeebled, or with gastric derangements, give intestinal lavage with yatren alone.
4. Laymen in the bush away from medical aid should take, from the onset of symptoms, stovarsol according to standard medical prescription, or bowel lavage with yatren.
5. Lacking these latter, then El Kossam (*Brucea sumatrana*) 50 cgm. of the powder in gelatine; or Segond pills (ipecac. 0·40, calomel 0·30, extract opium 0·05); or Dover's powder.

H. M. H.

FONTANEL (J. P. J.) & MELNOTTE (P. E. M.). Thérapeutique et prophylaxie de l'amibiase. [**Amoebiasis, its Treatment and Prevention.**]—*Arch. Méd. et Pharm. Milit.* 1927. July. Vol. 87. No. 1. pp. 57–68. [1 ref.]

In an interesting paper the authors describe in some detail the treatment of amoebiasis in its various clinical phases and its prophylaxis. They advocate measures all already well-known and often used, which do not here call for further specification. As to prophylaxis, it is still in its infancy. It is impossible to-day, the authors think, to do more than try to sterilize those human beings who may show themselves as carriers of the parasites by definite symptoms of amoebiasis.

H. M. H.

SEIBERT (F. M.). **Treatment of Amebiasis with Stovarsol.**—*U.S. Veterans' Bureau Med. Bull.* 1927. Aug. Vol. 3. No. 8. pp. 770–773. [U.S. Veterans' Hosp., Fort Snelling, Minn.]

For two years the best results were obtained from the use of emetine hypodermically followed by a course of emetine-bismuth-iodide internally. If amoebae were still found in stools, 0·6 gram neosalvarsan

was given intravenously once a week for 6 or 8 doses. Often severe gastro-intestinal disturbance was noted after the emetine-bismuth-iodide, nausea, emesis, eructations and borborygmus, and it is doubtful if the neosalvarsan circulating in the blood stream had any marked effect upon organisms living in the intestinal wall or lumen of the intestine. Early in 1926 stovarsal was substituted for emetine-bismuth-iodide. Stovarsol was given by mouth in 0·25 gram doses t.i.d. for seven days, during which emetine hydrochlor. two-thirds gr. was given b.d. hypodermically. All medication was then stopped for three days, followed by salts every morning for six days, and the stools examined. If six stools were negative patient was discharged with advice to have stool examined again after 60 days. If stools were positive after the seven days' treatment, another course of stovarsol was given, but no emetine except in rare cases. By this treatment a much larger proportion of cases showed negative stools than after the E.B.I. treatment. Only four cases of over 300 treated with stovarsol developed mild rash, and this disappeared in one to three days after discontinuing the drug.

H. M. H.

VAN NITSEN (R.). L'action des sels d'uranium dans certaines affections tropicales. [**Action of Uranium Salts in some Tropical Affections.**] —*Rev. Méd. et Hyg. Trop.* 1927. July-Aug. Vol. 19. No. 4. pp. 113–120.

The author's experience with this drug in rather a few cases of various tropical diseases leads him to conclude that :

Nitsol appears to have a specific action in amoebic dysentery. Given intravenously, 1 to 5 cc. in 1 per cent. solution every 48 hours, a course totalling 10–15 cc. generally suffices. In view of the toxicity of uranium it is wise to stop the treatment when the amoebae disappear, and not to go beyond the 15 cc. of nitsol.

Externally applied, salts of uranium have a definitely antiseptic action in tropical ulcer. Injected intravenously, of the four salts (uranium chloride, uranium nitrate, chloride of uranium and copper, and nitsol (double salt of sodium and uranyle)) the last is the least toxic. They bring about improvement and cure in cases of syphilis and yaws. They have no effect in recurrent fever and in malaria.

H. M. H.

JAKOBY (Curt). Ueber Spirocid bei Behandlung der Amöbendysenterie. [**Spirocid in the Treatment of Amoebic Dysentery.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1927. June. Vol. 31. No. 6. pp. 253–257.

The author points out the drawbacks to the use of emetine, yatren and stovarsol. Spirocid (4-oxy-3-acetylamino-phenyl-arsenic-acid) has been favourably reported on in the treatment of syphilis. Brief clinical description is given of 7 cases of dysentery thus treated. In 5, *Entamoeba histolytica* was demonstrated in the muco-sanguineous stools. In 2 of them, after emetine had failed to procure relief, spirocid therapy was followed by disappearance of symptoms, and in one where cysts had been present these disappeared. In another, with bloody mucous stools and enlarged tender liver, rapid disappearance of hepatic and intestinal symptoms followed on spirocid therapy. In the remaining

two cases spirocid treatment procured rapid "cure." Two other cases (*E. histolytica* not demonstrated) with mucous stools, enlarged tender liver, tenesmus and abdominal pain, were "cured" by spirocid treatment, one of them after emetine had failed. Spirocid was given in tablet form, 0·25 gm., two or three daily until symptoms subsided. The author admits that these cases are so few in number as to enforce caution in forming conclusions, but the advantage of an effective addition to the armamentarium against dysentery is obvious. [One may safely predict that spirocid, like stovarsol, will have its dermatitis.]

H. M. H.

BUCHMANN (Max). Zur Therapie der Amöbenruhr bei Kindern [**Treatment of Amoebic Dysentery in Children.**]—*Deut. Med. Woch.* 1927. May 27. Vol. 53. No. 22. p. 928.

A brief paper summarizing the author's experience in treating amoebic dysentery, in children, in Palestine. 2½ mgm. emetine for each age-year is insufficient. He stresses the warning that effective dosage such as 0·04 gm. per age-year, owing to the cumulative action of emetine, is dangerous for weakened children. Fatal results are known. On the other hand he has not found any danger from yatren. It is a "specific" for amoebic dysentery, administered *per os.* It was effective also in cases of colitis, the aetiology of which was not accurately established by microscopical investigation. At first he used a 4 per cent. solution, 5–10 cc. daily to 6 months old, and 10–15 cc. to 12 months old children. This dosage he considers too high; it is best to begin with smaller doses, a 2 per cent solution, 1 cc. for each age-month. In older children this dose can be doubled.

H. M. H.

VAN STEENIS (P. B.). Enkele opmerkingen over de behandeling van het tropisch leverabsces (abscessus hepatis amoebicus). [**Treatment of Tropical Liver Abscess.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 3. pp. 358–368. With 1 chart in text. [12 refs.] [Military Med. Lab., Weltevreden, Java.]

Though there is no doubt that emetine alone can cure liver abscess' its uncertain action on intestinal amoebiasis makes the chance of relapse too high to trust to it only. Emetine therefore should be followed by yatren or stovarsol. Of four cases treated in this way, three were completely cured, one apparently relapsed. The author believes that hepatitis recurs not from amoebae in the abscess wall which have escaped action of emetine, but from a new invasion of tissue from the gut. Yatren and stovarsol show no direct effect on the liver abscess. If the liver remain definitely enlarged, notwithstanding emetine treatment ("dead abscess"), the pus should be evacuated by puncture, or by operation; for the latter local anaesthesia usually suffices.

W. J. Bais.

HODSON (V. S.). **Case of Amoebic Hepatic Abscess, treated as an Out-Patient with Emetine Only.**—*Proc. Roy. Soc. Med.* 1927. July. Vol. 20. No. 9. pp. 1334–1335 (Clinical Sect. pp. 70–71). With 2 text figs.

A man 39 years old—in June, 1926, dysentery in India—"successfully" treated with emetine. In England, in January, 1927, there began indefinite and slowly increasing illness. When examined April 1st, presented muddy complexion, temperature normal, limitation of movement of right chest,

slight prominence over liver area, impaired percussion note below angle of scapula, dullness beginning in front at 4th intercostal space in nipple line, breath sounds deficient, particularly behind, a few fine crepitations, no bronchial breathing, voice sounds not markedly altered. X-ray (April 1st) showed fixation of right diaphragm, with very definite upward enlargement of right hepatic lobe (skiagram illustrated). Patient was ordered emetine grain 1·0 for three days: 7 days later he said he had been increasingly able to work and omnibus riding no longer caused pain. X-ray showed diminution of right-lobe-bulge and some diaphragm movement. He was ordered emetine gr. 1.0 on April 8th, 9th, 10th and again on April 15th and 16th. On April 22nd free movement of diaphragm, percussion normal and breath sounds audible down to 11th rib behind. Skiagram (illustrated) on April 22nd shows right hepatic lobe almost normal in upward limit. Complexion, appetite, and general feeling of health were normal.

H. M. H.

SAUTET (J.). Recherches expérimentales sur quelques produits employés dans le traitement de la dysenterie amibienne. [**Experiments with Drugs employed in the Treatment of Amoebic Dysentery.**]—*Ann. Parasit. Humaine et Comparée.* 1927. Oct. 1. Vol. 5. No. 4. pp. 329–343. [17 refs.] [Parasit. Lab., Faculty of Med., Paris.]

Before his departure for South America, Professor BRUMPT asked the author to investigate the action of emetine on *Entamoeba dysenteriae* [*histolytica*] and *Entamoeba dispar* in culture.

Full details of this investigation are here given, of which the author's own résumé is as follows :—

1. *E. histolytica* and *E. dispar* cannot be distinguished in cultures by any difference in sensitiveness to emetine. The toxicity of this drug is the same for the species *in vitro*.

2. The action of various drugs on cultures of amoebae (*E. histolytica* and *E. dispar*) was studied.

The amoebae were killed in 24 hours by the following doses :—

Emetine	1/500–1/1,000.
Cephaline	1/50,000–1/75,000.
Ipecac	1/50–1/100.
Emetine-bismuth-iodide	1/500–1/100.
Stovarsol	1/600.
Yatren	1/200–1/400.
914	1/10,000–1/50,000
Iodine	1/600.
Sublimate	1/250

3. (*a*). Iodine is much more lethal for amoebae *in vitro* than the experiments with cultures show.

(*b*). Stovarsol appears to be more active in the presence of liver extract, than when added directly to the cultures.

(*c*). Emetine has a more rapid amoebicidal action in solution in serum than in ordinary aqueous solution.

H. M. H.

BÉTEAU (J. P.). A propos de la thérapeutique de l'amibiase. [**Treatment of Amoebiasis.**]—*Rev. Méd. et Hyg. Trop.* 1927. Jan.–Feb. Vol. 19. No. 1. pp. 18–21.

The author reports favourably on the use of a compound of iodide of bismuth, quinine, and arsenic (Robert & Carrière), Tri-Iodo-Ercé, an intramuscular injection of which compound is given every two or three days.

H. M. H.

YORKE (Warrington) & ADAMS (A. R. D.). **Amoebic Dysentery. I.—Investigations into the Life-History of** *Entamoeba histolytica.*—*Brit. Med. Jl.* 1927. Sept.17. pp. 486–490. [16 refs.]

A critical and comprehensive restatement and review of their own, and various other workers', experimental and clinical observations, bearing on points in the life-history of the parasite, of clinical, and especially of epidemiological, importance. Until recently it was believed that animals could be infected only by feeding on the cysts, or by injecting active amoebae into the large intestine. Certain investigations (1914–1919) on excystation suggested that cysts would hatch only after being acted on by gastric and pancreatic juices. DARLING's work (1913) had however not been noted. He described gradual disappearance of cysts from moist chamber preparations of heavily infected faeces, and also development of amoebulae within, and their emergence from the cysts. DOBELL and LAIDLAW (1926) initiated cultures from *E. histolytica* cysts passed in faeces. They stated that " Cysts just passed in stools do not hatch, or develop further, if placed immediately in culture media and incubated at 37° C. ; they merely die. They must first be allowed to cool, and then must be kept for a certain time "—approximately 2 days outside the body was required for " maturation." This was epidemiologically important, for it implied that faeces of chronic amoebic dysenterics were not infective for one or two days after being voided. The authors describe their reinvestigation of this subject.

These experiments led to the conclusions that cooling outside the body was not essential for development of cysts or for excystation ; usually most of the cysts were alive, but an appreciable number—probably of quadrinucleate type—were dead, at time of passage of faeces ; and that, as the relatively poor hatch obtained from cultivation of freshly passed faeces could not therefore be due either to necessity for cooling outside body, or to majority of cysts being dead when passed, it must be result of something in faecal material itself which, while not preventing development of the cysts, did inhibit their excystation. DOBELL and LAIDLAW claimed that only the completely developed cysts survived cooling outside the body, thus raising a point of practical importance, by implying that a stool in which uni- and bi-nucleate forms predominated among the cysts, was relatively only slightly infective after it had been passed for a short time. The authors' experiments show that cooling the faeces to 0° to 5° C. for one or two days had no appreciable effect on either the immature or the mature cysts. Further experiments (here described) confirmed that presence of faeces, or of faecal extracts, in the culture tubes, had a definitely inhibitory action on excystation, although it did not prevent development of uni- and bi-nucleate into quadri-nucleate stage. The authors describe their further experiments which showed that *E. histolytica* cysts began to die fairly rapidly in faeces which had been kept at 16° to 20° C. for three or four days, and all were dead after 10 days ; approximately the same results if kept at 0° C. in ice-chest.

In freshly passed stools placed at once in incubator at 37° C. the cysts were nearly all dead in less than 24 hours ; sometimes but few cysts survived longer than 10 hours. Washed suspensions of the cysts in water lived longer, especially if stored at 0° C., but even here live cysts were not found after three weeks. *E. histolytica* cysts survived temperature 45° C. for 30 mins., but were killed within 5 mins. at

50° C. The cysts were remarkably resistant to emetine and yatren, and relatively so to HCl and Cl; the last-named in strengths far in excess of that used in bacteriological sterilization of water had no effect on the cysts in half an hour. The authors' investigations indicated that cysts did not hatch in the body of the hosts in which they were formed.

They cite clinical and experimental observations to show that mature quadrinucleate cysts developed from the precystic stage, in the gut, in 6–8 hours' time; and that the whole cycle from precystic stage, through mature cyst, to excysted quadrinucleate amoebae could be passed through in 12 hours. If this happened in bowel large numbers of cysts would be constantly hatching and wasted. There was much evidence to show that this did not happen: thus, the authors had never found in stools any of the characteristic recently-excysted amoebae with their four closely-agglomerated nuclei; and although development proceeded apparently uninterruptedly to formation of mature cysts, these did not hatch in bowel, possibly partly owing to lack of sufficient moisture in rectum, but mainly because of presence in faeces of something which inhibited excystation. They cite clinical and experimental data to show that mature quadrinucleate cysts remained viable in bowel for generally not more than a day or two at most. Obviously there may be essential difference between large intestine of man and of kitten; contents of the latter's rectum may not have same power of inhibiting excystation. Then, again, in SELLARDS and THEILER's experiments, fluid was introduced into kitten's rectum—and fluid is essential for excystation.

Yorke and Adams declare their belief that the sole purpose of the cyst formation in *E. histolytica* infections is propagation of parasite from one host to the next; and that Nature has devised a method of safeguarding this, and of preventing the wastage which would result if hatching of cysts occurred in intestine in which they are formed.

H. M. H.

DOBELL (Clifford). **Further Observations and Experiments on the Cultivation of *Entamoeba histolytica* from Cysts.**—*Parasitology.* 1927. Sept. Vol. 19. No. 3. pp. 288–313. [11 refs.] [Nat. Inst. Med. Research, London, N.W. 3.]

The author states that it is probable that cultures were first made from the encysted forms of *E. histolytica* by BOECK and DRBOHLAV in March, 1924. Though not first in the field, he claims for himself and LAIDLAW priority over YORKE and ADAMS in the discovery how to cultivate *E. histolytica* and several other entozoic amoebae from cysts (Dec. 1924).

The present paper, he states, is an elaboration of the work previously reported in conjunction with Dr. P. P. LAIDLAW. The experimental observations here given are fully reported and discussed and the author concludes that:—

(1) Under artificial (cultural) conditions, the free amoebae of *E. histolytica*—both human and simian strains—may survive at ordinary room-temperature up to 3 days: but there is no evidence that they can ever live longer. At 37° C. however, under like artificial conditions, some may survive for 5 weeks.

(2) Cysts of *E. histolytica* can remain alive at room temperature for any time up to at least 37 days, though they usually die within a few days if kept continuously at body temperature.

(3) At room temperature, the amoebae of *E. histolytica* are usually killed by exposure to N/20 HCl for only a few minutes. Isolated individuals, however, may withstand such treatment up to 20 minutes, though none survive for more than half an hour. But at 37° C. individual amoebae may survive exposure to N/20 acid up to one hour, though the majority are killed much sooner.

(4) The cysts of *E. histolytica* can hatch, and produce normal, viable, and readily cultivable amoebae, if kept continuously at 37° C. from the moment when they reach maturity. Previous cooling is not necessary to induce excystation and under artificial conditions cysts are able to continue their development immediately—without any period of rest intervening.

(5) En- and ex-cystation can take place in the same surroundings. Under cultural conditions the cysts of *E. histolytica* can hatch, and the resultant amoebae can develop in the same environment as that in which they were formed.

H. M. H.

FRASER (Neil D.). **Amoebic Dysentery. The Laboratory Examination of Dysentery Stools for** *Entamoeba histolytica.*—*China Med. Jl.* 1927. Sept. Vol. 41. No. 9. p. 801.

A description of a simple method of picking out amoebae :—

(1) Work a little of the faecal matter into a drop of normal saline solution in centre of slide.

(2) Cover with cover slip.

(3) Using low power ocular and 1/3 objective focus by means of coarse adjustment screw.

(4) Close shutter to cut off all bright light and focussing by fine adjustment screw pick small bodies which appear as bright "stars." (Bubbles also appear as bright stars but one soon learns to disregard them—careful placing of cover glass avoids bubbles and confusion). Having centred a star, open the shutter, turn on the 1/6 objective, focus and examine morphological character. If no amoebae or cysts found, then turn to the 1/3 objective and try again. In this way the whole smear can be quickly examined.

H. M. H.

CRAIG (Charles F.). **Observations upon the Hemolytic, Cytolytic and Complement-Binding Properties of Extracts of** *Endamoeba histolytica.*—*Amer. Jl. Trop. Med.* 1927. July. Vol. 7. No. 4. pp. 225–240. [11 refs.] [Army Med. School, Washington.]

The technique of this research and the discussion of results cannot in fairness be condensed into any useful abstract. The author's own conclusions are :—

"1. There were present in the absolute alcohol extracts of forty-eight-hour-old cultures of *Endamoeba histolytica* hemolytic, cytolytic and complement-binding substances.

"2. The hemolytic properties of such extracts were destroyed by heating the extracts to 80° C. in a water bath for one hour.

"3. The hemolytic substance was soluble in absolute alcohol and practically insoluble in normal salt solution.

"4. The hemolytic substance was not an exotoxin, as it was not present in the supernatant fluid of cultures of *Endamoeba histolytica*.

"5. The hemolytic agent was only present in the living organism, as extracts of old cultures containing no living amebae possessed no hemolytic properties.

"6. The hemolytic agent was not specific for human red blood corpuscles but was equally hemolytic to rabbit and guineapig erythrocytes.

"7. The extracts did not contain any bacteriolytic substance.

"8. The complement-fixing substance contained in the extracts was apparently specific for *Endamoeba histolytica*, the blood sera of individuals harbouring other amebae giving negative reactions with these extracts."

[This last finding is of obvious and immediate clinical import.

H. M. H.

Bacillary Dysentery.

Kalic (Dimitrije). **A Comparison of Three Different Systems of Classification of Dysentery Bacilli : English, German and Japanese.** — *Jl. Path. & Bact.* 1927. Oct. Vol. 30. No. 4. pp. 593–601. [13 refs.] [Lister Inst. of Preventive Med., London.]

Many classifications of the dysentery bacilli have been given and when these differ in different countries there is apt to be confusion of terminology. The author has made careful comparison of strains representing types in different classifications. All the original type strains of Andrewes, which represent the English subdivision were still available—V Oxford Flexner, V_z Mason, W Cable, W_x Mountain, X Hughes, Y original Hiss and Russell, Z Whittington. It was not possible to obtain the German B, C, F and G types of Kruse. Of the Japanese types of Aoki, VI was rough, while VII and XI are considered not to belong to the dysentery group and IX was not obtained. Tests used for establishing identity were cross agglutination, cross absorption, fermentation and acid agglutination. The following useful table is given embodying the results of the investigation :—

Andrewes' types.	German types. (Kruse).	Japanese types. (Aoki).
V	B? or C?	—
V_z	A	—
W	—	—
W_x	—	—
X	—	II
Y	D	I
Z	H	X
(Shiga)	(Shiga-Kruse)	VIII (Shiga)
—	—	III & V
—	—	IV
—	E (Sonne)	—

W. F. Harvey.

CASTELLANI (Aldo). **The Classification of Bacterial Dysenteries and of Dysentery Bacilli.**—*Fifteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1926. pp. 89–103. With 6 figs. [12 refs.] Also in *Amer. Jl. Trop. Med.* 1927. July. Vol. 7. No. 4. pp. 199–216. With 1 text fig. [12 refs.]

This is a combined clinical and bacteriological classification. The bacterial dysenteries are separated into the three groups : (1) *Bacterial dysentery sensu stricto* due to organisms fermenting neither lactose nor mannite and not clotting milk (Shiga-Kruse bacillus). (2) *Para-dysentery* due to organisms which do not ferment lactose and do not clot milk, but ferment mannite (Flexner, Hiss, Russell, etc.). (3) *Metadysentery* due to organisms which either ferment lactose and clot milk, or ferment lactose and do not clot milk, or do not ferment lactose but clot milk (*Dysenteroides* and *Lankoides* genera). The author suggested this classification some years ago, but it has received very little attention. [The reason for this neglect would seem to be that bacteriologists are not yet prepared to accept the differentiation of the dysentery organisms into rigid species. The Shiga-Kruse bacillus is well characterized, but the relationships of the mannite fermenting organisms to the Shiga-Kruse bacillus and to one another are still in a very fluid state.]

W. F. Harvey.

CASTELLANI (Aldo). **Notes on the Aetiology of Certain Cases of Recurrent Diarrhoea and Certain Obscure Forms of Colitis due to Bacteria of the Metadysentery Group.**—*Jl. Trop. Med. & Hyg.* 1927. Nov. 15. Vol. 30. No. 22. pp. 285–294. [17 refs.] [Ross Inst. & Hosp., London, & Tulane Univ., New Orleans, U.S.A.]

The " metadysentery " group of the author comprises bacilli somewhat related to those of the true dysentery group : they do not produce gas in any sugar, but either produce acidity in lactose media or clot milk or do both. There are several clinical conditions, acute or chronic, in which organisms of this group have been found. Diagnosis is difficult, as bacteriological examination of the stools may be negative and require repetition before metadysentery organisms are found. The blood of chronic cases usually agglutinates the organism isolated from the stools.

W. F. Harvey.

WISEMAN (W. R.). **Unusual Dysenteric Infections. With Addendum.** —*Jl. of Hyg.* 1927. July. Vol. 26. No. 2. pp. 187–197. [10 refs.] [Public Health Lab., Glasgow.]

The reports which are now being made on the presence of SONNE'S group III dysentery bacillus in Great Britain and elsewhere show that its distribution is probably a wide one. In this paper, clinical data are given of cases from which the organism was isolated, and show how very varied the symptoms may be and how often the cases are sporadic in their appearance. A full series of characters of the various test organisms was investigated and comparisons made with known Sonne dysentery strains. All of them showed fermentation of lactose in 7 to 9 days and produced acid and clot in litmus milk in from 11 to 22 days.

For the serological tests, formolized veal broth cultures were found to be much more satisfactory than formolized emulsions from agar. A difficulty which may prevent the bacteriological diagnosis of cases is this, that the organism may be inagglutinable by the patient's serum and by immune sera until it has been subcultured for some time. Other characters then, such as the heavy sedimentation of the growth in the peptone water fermentation fermentation tests, the tendency to bipolar staining and formation of a few filamentous forms and the agglutination of stock Sonne III bacilli by the patient's serum may be required to obtain a more rapid diagnosis.

W. F. Harvey.

WARREN (S. H.). **An Outbreak of Illness caused by** *B. dysenteriae* **Flexner.**—*Lancet.* 1927. Sept. 3. pp. 494–495. [College of Med., Newcastle-upon-Tyne.]

The illness was entirely confined to two families living together in a two-roomed flat, sharing the same scullery and W.C., but cooking and eating separately. Of the seven people involved four suffered from acute dysentery or diarrhoea. The illness proved fatal in 2 cases, 6 years and 2 years old. The bacillus isolated in all four cases invariably gave the reactions and showed the general characters of *B. dysenteriae* Flexner—in one of the cases it was isolated (post-mortem) from brain, liver, spleen, stomach and intestine.

H. M. H.

ALBERT (Jose) & QUIASON (Jaime O.). **Clinical Features of a Recent Epidemic of Bacillary Dysentery.**—*Jl. Philippine Islands Med. Assoc.* 1927. July. Vol. 7. No. 7. pp. 246–250. [5 refs.] [Coll. of Med., Univ. Philippines.]

1. The authors' cases in the pediatrics clinic of the Philippine General Hospital occurred simultaneously with outbreaks in several other parts of the Archipelago.
2. The disease attacked several members of the same family at the same time, children succumbing more easily than adults—the younger the child the graver the prognosis.
3. The epidemic was due mainly to *B. dysenteriae* Flexner.
4. Starvation diet should not be unduly prolonged. The appetite is a good guide for early institution of liberal diet and foretells recovery.
5. Recrudescences are not due to indiscretion in diet.
6. Specific serum treatment was disappointing.
7. The epidemic, May to October, 1926, gave a mortality of 31·6 per cent. in 136 cases.

H. M. H.

LEUCHS (J.) & PLOCHMANN (E.). Zur Frage der Ruhrerreger. [**On the Causal Organisms of Dysentery.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Oct. 31. Vol. 104. No. 5-6. pp. 347–355. [2 refs.] [State Bact. Research Inst., Würzburg.]

It had been a common experience of the authors to isolate from dysentery stools organisms which morphologically, culturally and in

sugar reactions were identical with strains of the Y-Flexner group and yet did not agglutinate with the serum of that group. They instituted a comparison between their strains and the A to J types of KRUSE and the types E and D of ELKELES together with the corresponding sera. Some of the authors' strains were agglutinated by the E antisera of KRAUS and ELKELES, but partially and in fine granular form, contrasting markedly with the loose flocculent precipitate given by their own serum. It was then noticed that two sorts of colonies were given by their own strains on China blue agar. The one colony (*g*) was arched, glossy and had a smooth edge, the other (*fl.*) was flat, dry and more or less lobed. The colonies developed from a " g " type might be either g or fl. forms, those from " fl." colonies were only fl. in type. Agglutinating sera were prepared from 24-hr. old colonies, which were at that stage characteristic, and less liable to contain a mixture of type. The g serum agglutinated mixed and g colonies in large clumps to 1–1,000 and fl. colonies in small granules, but only to 1–100. The fl. serum did not agglutinate or only in slight degree the g colony type but agglutinated finely the fl. colonies and the KRUSE-ELKELES E strains in 1–4,000. It also agglutinated such mixed colonies as gave rise to a large proportion of fl. colonies. The authors conclude that the E sera of KRUSE and ELKELES are sera to fl. colonies and could only pick out this type. The corresponding E strains also produce none but fl. colonies. Their own organism is an E strain of dysentery which has been shown capable of dissociating into spherical and flat colony types. The importance of this observation lies in this that it explains how a serological examination in cases of clinically certain dysentery may be negative ; for it is the spherical colony which appears most commonly on plates from the stools. If sera are used which have been derived from colonies consisting of organisms which give rise for the most part to the g type of colony, then the proportion of positive findings becomes definitely increased.

W. F. Harvey.

LESTER (Vera). **A Study of the Lactose Fermenting Dysentery Bacilli (Sonne's Group III).**—*Acta Path. et Microb. Scandinav.* 1926. Vol. 3. No. 4. pp. 696–710. [14 refs.] [State Serum Inst., Copenhagen.]

The first classification of dysentery bacilli, by HISS, was largely based on sugar reactions and separated the 4 races, Shiga, Flexner, Strong and Y. Of these the Shiga bacillus does not ferment mannite. The other three ferment mannite and are variously called the Flexner, the pseudodysentery and the paradysentery group. This group ferments glucose and mannite in less than 24 hours but fresh strains never ferment lactose during the first 24 hours. Serum reactions have been applied for the differentiation of the mannite fermenters, but only one strain shows a high degree of serological distinctness without overlapping : it is Sonne's group III strain. According to SONNE the strains of this group are the cause of diarrhoeic diseases especially in children. Thirty one strains have been isolated by the author from about 2,000 stools. These strains were obtained from very small outbreaks, of 1 to 5 persons. The symptoms were a mild diarrhoea with moderate fever and mucus, sometimes blood, in the stools.

Fermentation reactions were carried out in sugar-free broth containing ½ per cent. sugar, with reaction pH7·5 and brom thymol blue indicator. All the paradysentery bacilli have the following features in common: fermentation of glucose and mannite in 24 hours, but no fermentation of adonite, dulcite and salicin. Sonne's group III has, as special characters, the early fermentation of rhamnose, l-arabinose, maltose and the late fermentation of lactose and d-arabinose with inability to ferment sorbite. In this research attention was also paid to serological reactions. For agglutination 12-hr. agar cultures, suspended in normal salt solution containing 1–500 formalin, were used and readings were taken after 18 hrs. at 45° C. Great variability was found in the serological properties of group III strains: a strain might be agglutinated one day to full titre, and the next day be quite inagglutinable. This occurred both with fresh and old strains and the explanation given by the author is the tendency they had to dissociate into variants whose agglutinability varied in all degrees. As regards fresh cultures, a table is given showing that all the strains examined, even those agglutinating weakly at first, were agglutinable to full titre after 6 to 10 subcultures. None of the strains belonging to group III showed agglutination with sera of other groups to any high degree. The author concludes that the group is well characterized by its serological as well as by its biochemical reactions and that the biochemical reactions are the more constant and clearly defined.

W. F. Harvey.

PATTO (J. Ortiz). Sur des variations curieuses d'un bacille du groupe Flexner-Hiss. [**Curious Variations in a Bacillus of the Flexner-Hiss Group.**]—*C. R. Soc. Biol.* 1927. Oct. 21. Vol. 97. No. 27. pp. 1084–1086. [" Vital Brazil " Inst., Niteroi, Brazil.]

In a 1 per cent. maltose Hiss serum water medium with phenol red indicator this organism was found to give slight acidification in 24 hrs., which, however, had totally disappeared again in 72 hrs. Different concentrations of sugar were tested with the following results: No acidification in 72 hrs. with 0·2 per cent. maltose; slight acidification in 0·4 per cent. concentration after 24 hrs. and return to original in 48 hrs.; definite acidification in concentrations of 1, 2 and 4 per cent. with partial coagulation and return again to original in 72 hrs.; commencing acidification at 6 per cent. concentration from the 3rd hour, which became complete, with coagulation in 24 hrs., with reversion towards alkalinity in 72 hrs. Similar tests with Y-Hiss-Russell and Flexner Oxford strains of the Lister Institute showed that the former did not ferment maltose at any concentration, whilst the latter gave fermentation from concentrations of 1 per cent. onwards. In the matter of serum tests it is observed that neither anti-Schmitz nor anti-Sonne serum had any appreciable agglutinating action on the organism. With anti-Y-Russell serum on the other hand it agglutinated to titre and also with anti-Flexner-Oxford serum but not to titre. Absorption tests, again, differentiated the test organisms from both Y-Russell and Flexner. This organism then, is an intermediate type, approaching the Flexner in fermentative characters and related to the type Hiss in agglutinating character.

W. F. Harvey.

PATTO (J. O.). [Sobre uma variaçao anomala de um pseudo dysenterico do grupo Flexner-Hiss.] [**Anomalous Variation in an Organism of the Flexner-Hiss Group.**]—*Arch. do Inst. Vital Brazil.* 1927. Apr. Vol. 4. p. 91. [Summarized in *Bull. Inst. Pasteur.* 1927. Aug. 15. Vol. 25. No. 15. pp. 673–674.]

The organism fermented glucose and mannite but not lactose nor saccharose. Litmus maltose media showed first an acid change and then became alkaline in 48 to 72 hours. Acidification is proportional to the concentration of sugar but the medium ultimately becomes alkaline whatever the concentration. This organism in its action on maltose resembled the Flexner bacillus and in agglutination reaction the bacillus of Hiss. The author calls it Y3.

W. F. Harvey.

WOLFF (J. W.). Serologische groepeering van Pseudo-dysenteriebacillen, gekweekt bij gevallen van Bacillaire Dysenterie in Deli. [**Serological Grouping of Pseudodysentery Bacilli cultivated from Cases of Bacillary Dysentery in Deli.**]—*Ned. Tijdschr. v. Hyg. Microbiol. en Serologie.* 1927. Vol. 2. No. 1. pp. 44–69. With 7 graphs.

The study which is here set out has been carried on since 1922, but refers in particular to about 1,100 strains isolated between 1924 and 1926. These have been carefully compared by cross agglutination and absorption tests with the groups of Y-Flexner bacilli described by ANDREWES and INMAN in the Medical Research Council Special Report Series No. 42, 1919. By far the commonest of the pseudodysentery organisms isolated was the Deli strain Y25, which corresponded absolutely with the London strain W. Its percentage frequency was 37·6, as compared with, Y28 and F1·7 (London Z-Y) 22·2, Y29 (London V) 8·2, F1·10 and F1·30 taken together 2, F1·35 (? London X) 3·2, and inagglutinable strains 26·8. The Y25 (W) group was by far the most constant serologically and clinically, while other groups seemed to be less stable in character. Pure London X strains were not found in Deli, nor were pure single Z and Y strains.

W. F. Harvey.

PICKWORTH (F. A.). **Agglutination of Typhoid and Dysentery Organisms by the Sera of Mental Hospital Patients.**—*Jl. Path. & Bact.* 1927. Oct. Vol. 30. No. 4. pp. 627–640. With 13 figs. [69 refs.] [Research Labs., Hollymoor, Northfield, Birmingham.]

The sera of about one-quarter of the inmates of mental hospitals show positive agglutination reactions to typhoid and dysentery organisms. These reactions are exhibited almost to an equal degree by these patients on admission and after a sojourn in hospital, so that it cannot be argued that they developed as a result of infection during their residence. [It would have been interesting to have an indication of the degree to which sera of patients of other than mental hospitals, and of similar age and sex distribution gave similar reactions.] The tempting explanation of the high degree of the reactions is put forward, that they are due to an unsuspectedly large number of past infections with the specific organisms which are perhaps trivial, chronic and unnoticed but lead to the production of agglutinins. Such infections may

even be causally related to the mental disorders from which the patients tested suffered. If this thesis can be sustained it is obvious that specific agglutination reactions would have to be regarded as suggesting the possibility of past infection, quite apart from evidence of the occurrence of clinical disease.

W. F. Harvey.

YAOI (Hidetake) & YEJIMA (Shimmpei). **A Critical Investigation of Torikata's So-called "Koktigene" especially the Dysentery-Koktigene.**—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1926. Vol. 5. pp. 209–219. With 2 charts in text. [1 ref.]

Dysentery bacilli were used belonging to the exotoxic and endotoxic groups. Suspensions in normal salt solution of a strength of 4 mgm. per cc. were boiled for 30 minutes to provide the koktigen while the control suspensions, of a strength of 2 mgm. per cc., were heated at 53° C. for 60 minutes. In the experiments the different antigens were inoculated intravenously in rabbits and the sera furnished tested for agglutination titre and antibacterial power. The results of the experimentation were that : (1) the suspensions after boiling had lost toxicity for mice to the extent of one fourth and retained fairly good immunizing power ; (2) the supernatant fluid of centrifuged boiled suspensions, the so-called "Koktigen of Torikata" had about one-tenth the toxicity of the original suspension ; (3) the koktigen obtained from the endotoxic group of dysentery bacilli proved unreliable as antigen, whereas that from the exotoxic group acted as a fairly good immunizing agent.

W. F. Harvey.

SCHLOSSBERGER (H.) & WICHMANN (F. W.). Untersuchungen über die Bindungsverhältnisse von Dysenterietoxin und Dysenterieantitoxin. [**Combining Proportions of Dysentery Toxin and Antitoxin.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1927. July 25. Vol. 107. No. 3-4. pp. 716–724. [32 refs.] [State Inst. for Experim. Therap., Frankfurt a.M.]

The summary of the work of the authors is as follows :—

1. Increasing quantities of dysentery toxin require for neutralization, not proportionally increasing amounts of antitoxin but larger amounts. Thus while 1/1,000 cc. of the German standard dysentery serum neutralizes 1/44 cc. of bouillon toxin, it requires 1-36 cc. serum to neutralize only 1/14 cc. toxin. The same phenomenon is evident in the neutralization of a dried dysentery toxin preparation.

2. From determinations of the amounts of antitoxin required for neutralization of increasing quantities of any given dysentery toxin preparation, it must be concluded in this case, as in that of diphtheria, that any such preparation contains variable quantities of toxin and toxoid, with different affinities for the specific antitoxin.

3. The observation that 30 times the quantity of antitoxin needed to neutralize a single unit of dysentery toxin, was required to neutralize only 3 units of the same toxin is explainable on the ground that the toxin-antitoxin mixture undergoes a partial dissociation in the body, which necessitates this use of an excess of antitoxin.

4. It follows that exact titration of dysentery sera is only possible on the basis of the use of a standard serum. An arbitrarily fixed quantity of the standard serum, which must be adhered to, is used for the titration of the toxin preparations employed in testing sera.

W. F. Harvey.

CASTELLANI (Aldo). **Further Observations on the Action of Bacilli of the Paratyphoid, Dysentery and Metadysentery Groups on Various Starches.**—*Jl. Trop. Med. & Hyg.* 1927. Sept. 15. Vol. 30. No. 18. pp. 229–230. [2 refs.]

Starches from 15 different sources were used and the results as regards acid formation were tested. Solution of a starch is seldom complete and the so-called "soluble starch" is really one rendered soluble by a special process. Readings were taken after 3 weeks at 37° C. With the strains which were available, it was found possible to differentiate, by means of their starch reactions, between *B. paratyphosus* A, B and C, between Shiga, Flexner and Y dysentery and between *B. ceylonensis* A and B. It remains to be seen whether this result holds good for all strains of these organisms. Moreover, if it does, the reaction can be used for the identification of the source of a particular starch.

W. F. Harvey.

PONOMAREFF (A. W.). Quelques conditions de l'action sur l'organisme des sérums antidiphtérique et antidysentérique. [**Conditions of Action of Antidiphtheritic and Antidysenteric Sera.**]—*C.R. Soc. Biol.* 1927. July 22. Vol. 97. No. 24. pp. 505–506. [1 ref.] [Inst. of Experim. Med., Leningrad.]

The theoretical consideration underlying this work, given by the author in a recent publication relating to antirabic serum, is that antisera do not come in contact with cerebral tissues until the "cerebro-vascular barrier" is broken down. In other words, until the walls of the cerebral blood vessels are rendered permeable to specific immune substances there is no protective effect exerted by way of the blood stream upon the central nervous system. In the case of toxins which have selective effect upon this system there is little likelihood that the neutralizing action by antitoxic sera will be exerted there. There are various ways in which the cerebro-vascular barrier may be broken down, such as superheating, injection of diphtheria toxin or of tuberculine, etc. In the experiments under consideration the mechanical method of SPERANSKY was adopted, consisting of suboccipital puncture and withdrawal of an appreciable amount of cerebrospinal fluid with a syringe. The fluid is at once re-injected and the operation is repeated 2 to 4 times. By this intracranial compression and decompression the blood vessels are rendered permeable.

Two rabbits each received an intravenous injection of the same quantity of diphtheria toxin (10 to 15 lethal doses) and 45 to 60 minutes later, each the same quantity of antidiphtheria serum (1,000 to 1,850 units) intravenously. In one of these rabbits the cerebro-vascular barrier was then mechanically destroyed, with the result that whereas the control animal died at the end of 2 to 4 days, this one survived, or

died at a much later date. Similar protective results were obtained with antidysenteric serum. So also a dog, in which the cerebro-vascular barrier had been destroyed, showed the presence of antitoxin, which had been intravenously injected, in its cerebrospinal fluid, while the control animal did not.

W. F. Harvey.

SUZAKI (Keizo). Versuche ueber den Einfluss von Dysenterie-Toxin auf ein ueberlebendes Darmstück des Kaninchens. [**Effect of Dysentery Toxin on a Living Portion of Intestine of the Rabbit.**]—*Oriental Jl. Dis. Infants.* 1927. July. Vol. 2. No. 2–3. German summary pp. 139–140. With 68 figs. [In Japanese.] [Children's Clinic, Kyoto Imperial Univ.]

The toxin for experimentation was a colourless filtrate of a suspension of bacilli through a Chamberland candle and the types of organism used were Shiga, Y, Flexner, Strong and Oga. Different portions of the intestine were subjected to test, duodenum, jejunum, ileum, large intestine and rectum, with the following results :—

1. The duodenum and jejunum were stimulated, the other portions inhibited.
2. The action of the toxin upon the circular and longitudinal musculature of the several portions of the intestine was found to be the same as that upon these portions as a whole.
3. The action is upon muscle and not upon nerve.
4. No essential difference of action between the different types of organism was found.
5. Heating of the toxin at 100° C. weakened but did not change its action.

The author considers that the toxic action of the dysentery bacillus is due to its content in toxic protein.

W. F. Harvey.

JUNGEBLUT (C. W.). **Observations on the Skin Reaction induced in Rabbits, Guinea Pigs and Goats by the Intracutaneous Injection of Dysentery Toxin.**—*Jl. Immunology.* 1927. June. Vol. 13. No. 6. pp. 427–432. [10 refs.] [New York State Dept. of Health.]

The toxins used in experiment were, one prepared from the bacillary bodies and the other a toxic filtrate. Rabbits and guineapigs gave practically no skin reaction to dysentery toxin. It is rather extraordinary that the skin of the rabbit should be so insensitive, considering the great systemic susceptibility of this animal. In 2 goats the toxic filtrate likewise produced no appreciable reaction on intracutaneous injection. Nine goats were injected with the endotoxin of which 4 gave a reaction with redness and swelling, 2 swelling with no redness, and 3 no reaction at all. In the four animals which reacted to unheated endotoxin, a similar reaction was obtained with endotoxin heated for 2 hours at 100° C., indicating a high degree of thermostability of this toxin. In a series of experiments in goats to determine if the intracutaneous skin reaction could be used to indicate neutralization of toxin by antitoxin, the reaction obtained with mixtures of toxin and low dilutions of antidysentery serum was definitely less marked than that given by toxin alone or mixtures of toxin with normal, antityphoid or antistreptococcus serum.

W. F. Harvey.

YOSHITOMI (T.). Ueber den typus der Dysenterie-Bacillen und Prognose der Kinder-Dysenterie in Dairen. [**Prognosis of Dysentery of Children in Dairen according to Type of Bacillus.**]—*Oriental Jl. Dis. Infants.* 1927. July. Vol 2. No. 2–3. German summary p. 133. [In Japanese.] [Dairen Hosp., Dairen.]

In 1925, from dysentery cases in children the author isolated Y type in 26 cases, Flexner in 19 cases, and Shiga-original in 5 cases. The course of the illness was longest in the original type (Shiga) infections—33 days and these gave also the highest mortality.

H. M. H.

HIRANO (Rin) & SHIRAOGAWA (Hisashi). [**On the Dysentery Bacilli having Cholera Red Reaction.**]—*Eiseigaku Densenbyogaku* (*Jl. of Hygiene & Infect. Dis.*) 1926. Nov. Vol. 22. No. 4. [Summarized in *Japan Med. World.* 1927. June 15. Vol. 7. No. 6. p. 181.]

A cholera red reaction was given by 56 out of 447 (12·5 per cent.) strains of dysentery, whereas no case with this reaction was met with out of 20 *B. coli* examined.

W. F. Harvey.

PANAYOTATOU (Angélique). Sur une espèce d'entérobacille isolé des selles à entérite. [**An Enterobacillus in Enteritis.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Nov. 22. Vol. 104. No. 7-8. pp. 473–477. [Greek Hosp., Alexandria.]

The bacillus was met with in diarrhoeic or dysenteric stools and was only obtained in pure culture on Sabouraud's medium. Besides the yellowish white colonies of bacillary forms, this organism gave transparent colonies of coccoid forms. Some of the features by which it was distinguished from the enterococcus were: (1) formation of a pellicle in bouillon and intense faecal odour; (2) fermentation of lactose, glucose and mannite with gas production and of saccharose without gas production; (3) no pathogenicity for the mouse; (4) very pathogenic to guineapigs and rabbits.

W. F. Harvey.

POGORSCHELSKY (Herbert). Ruhrvaccine in der Prophylaxe der Säuglingsruhr. [**Prophylactic Dysentery Vaccine for Infantile Dysentery.**]—*Ztschr. f. Kinderheilkunde.* 1927. Aug. 17. Vol. 44. No. 1-2. pp. 200–203. [4 refs.] ["Kaiser- u. Kaiserin-Friedrich" Hosp., Berlin.]

Altogether 172 infants of ages from 6 weeks to 10 months came under observation, of whom 80 received vaccine and 92 served as unvaccinated controls. These children were in hospital suffering from diseases other than dysentery and no selection was exercised in separating the two groups. The vaccine contained 3 parts Y and 1 part Shiga-Kruse bacilli and had a content of 500 million organisms to the cc. It was injected subcutaneously in quantities of 0·25, 0·5 and 0·75 cc., without any particular local reaction resulting. In 16 out of the 80 vaccinated infants there was a rise of temperature which varied

from 38° to 38·5° C. (100·4° to 101·3° F.) and in one case to 39° C. (102·2° F.). The results in the two classes were: 6 cases, of which one occurred on the day after the first injection among the vaccinated (7·5 per cent.) and 17 (18·3 per cent.) cases among the unvaccinated. These results, so far as they go, are in favour of vaccination as a prophylactic measure in infants. The children only remained 8–16 weeks under observation so that no idea could be formed of the duration of protection.

W. F. Harvey.

Bieloousowa (A. J.). Le vaccin antidysentérique et son application. [**Antidysenteric Vaccine and its Application.**]—*Arch. Sci. Biol.* 1926. Vol. 26. No. 4–5. French summary pp. 387–388. [In Russian pp. 271–277.]

The author isolated from 12,480 cases of dysentery, Shiga-Kruse bacilli in 8,320, Hiss-Russell in 500, Flexner in 3,600 [60 negatives only]. A mixed vaccine was prepared containing 500 million bacilli of each type in 1 cc. Sensitized vaccines were made by treating the dysentery vaccines with the corresponding agglutinating serum 1 in 100. A vaccine was also prepared containing 1,500 million dysentery bacilli + 1,000 million cholera vibrios. Experiments with rabbits showed that after two doses of vaccine (well tolerated) agglutinins appeared in titre from 1 : 10–1 : 200. Sensitized vaccines gave the higher titre. Agglutinins were formed against each constituent of the mixed vaccine. Fifteen human beings were inoculated with the heated, and twenty with the sensitized vaccine. Febrile reaction was always insignificant, but the sensitized gave more local reaction than the heated vaccine. The sensitized vaccine is therefore the one of choice. The dysentery + cholera vaccine caused the formation of antibodies against both types of microbe.

H. M. H.

Combiesco (D.) & Brauner. Recherches sur le mécanisme de la vaccination par voie buccale contre la dysenterie chez le lapin. [**Mechanism of Oral Vaccination against Dysentery in the Rabbit.**]—*C.R. Soc. Biol.* 1927. Oct. 13. Vol. 97. No. 26. pp. 1004–1007. [2 refs.] [Exper. Med. Lab., Faculty of Med., Bucarest.]

A previous research (*Compt. Rend. Soc. Biol.*, lxxxviii, 1923, p. 904) had shown that the serum of orally immunized rabbits protected white mice against a lethal dose of Shiga dysentery toxin, although the serum itself agglutinated the dysentery bacillus only slightly or not at all. In the present investigation the authors find that extracts of spleen, liver and intestine of rabbits, which have been immunized orally against dysentery, have a high titre when their serum has little or no agglutinating power. The extracts which agglutinate most strongly are those like the spleen and appendix, which possess the most lymphoid tissue, and this fact is taken to indicate local production of antibody. At the same time the antigen if present in the intestine would appear to exert a sort of fixing action on the antibody in the blood as evidenced by the diminution in one rabbit of the agglutinating power of the serum, after feeding, from 1 in 160 to 1 in 20.

W. F. Harvey

Mixed and Unclassed Dysentery.

Chao (H. A.). **Diagnosis of Dysenteries.**—*Nat. Med. Jl. China.* 1927. Aug. Vol. 13. No. 4. pp. 324–331. [13 refs.] [Hunan-Yale Med. Coll. Hosp., Changsha, China.]

A valuable critical review, of no little importance, for dysentery is extremely common in tropical countries. Proper treatment is feasible only on prompt differentiation of the types of dysentery. The usual methods of differential diagnosis, clinical and laboratory, are not reliable and practical.

Soon after onset of dysentery correct diagnosis can be accomplished by simple microscopical study of the cellular exudate of the dysenteric stool. A massive degenerated-leucocytic exudate with polymorphonuclears predominating, and with endothelial macrophages and ghost cells, are the basic elements in the bacillary dysenteric stool. Amoebic dysentery exudate has scanty cellular elements, and *E. histolytica* is present in vegetative form. A diagnosis of amoebic dysentery is never warranted by the presence of cysts alone. A superimposed infection of bacillary dysentery on top of amoebic should be ruled out to avoid danger of using emetine.

Faulty diagnosis is mainly due to ignorance of cytodiagnosis of the exudate and the mistaking of macrophages for *E. histolytica.* Bacillary, *not amoebic*, has been the predominating type of dysentery in the tropics.

[The immediate practical value and reliability of cytodiagnosis of the bowel exudate in dysentery, though first noted and reported by Manson-Bahr (1910) and given comprehensive exposition by Willmore and Shearman (1918) and Anderson (1921) and Haughwout (1923)—is a long time a coming into general recognition and use. Has it yet reached a school—even a school of tropical medicine—syllabus?]

H. M. H.

Alexeieff (A.). Cytodiagnostic dans les affections du gros intestin (dysenteries bacillaire et amibienne, colitis ulcerosa). [**Cytodiagnosis in Affections of the Large Intestine.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Sept. 10. Vol. 103. No. 6-8. pp. 354–363. With 42 figs. on 2 plates. [4 refs.]

Careful illustrations in support of the author's cytological contentions add much to the value of this interesting paper. "Pyograms" are specific; that is to say, the reaction of an organism to a given microbic invasion is determined above all by the nature of the microbe, which makes a definite mark of some sort in the focus of inflammation. Thus, there is a striking resemblance between "gonogram" (gonococcal pus) and "meningogram" (meningococcal pus). In both were found neutrophiles with nucleus in a state of "caryophysema"—nucleus so hypertrophied as to reach the stage of "free nucleus." "Caryophysema" is a characteristic result of the toxin of these two microbes only.

The amoebo-gram (pyogram of amoebic dysentery) is very definite; but the ulcerations caused by the dysentery bacillus, as well as those of "colitis ulcerosa," give a "neutral" pus without indications of the nature of the pathogenic agent.

Cytodiagnosis.—Macroscopically the amoebic dysentery stool shows a typical raspberry-jelly like appearance. The blood is intimately mixed with other constituents of the stool. In the mass are scanty clots of mucus transparent as glass. In *the bacillary dysentery stool* the blood is in streaks, and even when there is much of it, it is not intimately mixed with the other stool constituents, and the numerous clots are quite opaque. By the microscope the opaque clots are seen to be made up of an enormous number of neutrophiles; while the transparent clots of amoebic dysentery are "mucilaginous," and contain only a very few cells. The pyograms of the two dysenteries are very different. *In bacillary dysentery* there are 97–98 per cent. neutrophiles, 1–2 per cent. eosinophiles, and some "plasmophages." *In amoebic dysentery* 20–30 per cent. neutrophiles, 1–2 per cent. eosinophiles (sometimes a local massive eosinophilia), some plasmophages and 70–80 per cent. small lymphocytes. (Naturally where there is massive local eosinophilia, the above leucocyte formula is altered.) Moreover, and very rarely, some neutrophiles have a nucleus in 6–7–8 segments, of unequal division and disposed fan-like, or like the petals of a daisy. This sort of neutrophile is absent from bacillary dysentery pus. Explanation of these macro- and micro-scopical differences must be sought in the pathological anatomy of the lesions.

In bacillary dysentery (excluding the gangrenous type), there is in the large intestine a superficial necrosis, slight, diffuse, but provoking an acute inflammatory reaction; hence the opaque neutrophile-crammed clots. In *amoebic dysentery* there is localized ulceration, deep, with undermined edges, forming an almost closed pocket, in which the blood (abundant for the deep lesion has eroded vessels of a relatively large calibre) has time to get intimately mixed with the ulcer-pus during peristalsis of the gut (spastic contractions of the intestine characterize both dysenteries). The solitary follicles are invaded by the amoebae; hence the 60–70 per cent., or more, lymphocytes in the bowel-exudate. But in *bacillary dysentery* the solitary follicles are equally invaded—and there is no lymphocytosis in the pus. This is probably because necrosis caused by the bacillary toxin progresses so quickly as to suppress the preliminary stage of proliferation from functional stimulus. For "small lymphocyte," it is perhaps preferable to substitute the term "pycnotic cell" (J. Anderson). If some of them show a large nucleus surrounded by a thin rim of cytoplasm, others show fusion of two or three nuclear masses. The author suggests they are neutrophiles in which fusion of nuclear segments has taken place. If this be so, this degeneration constitutes a sound differential character, for it is not seen in *bacillary dysentery* nor in *colitis ulcerosa.*

The author uses "plasmophage" as synonymous with "macrophage." In sections of mesenteric lymphatic glands from patients who had succumbed to *bacillary dysentery* or to *colitis ulcerosa*, many of these monophages can be seen, especially at periphery of the gland.

Colitis Ulcerosa—The author discusses its etiology. It is very common in Turkestan. It has been held to be simply chronic bacillary dysentery. *Macroscopically* the stools are identical with those of bacillary dysentery (especially of the "white" type, i.e., with little blood). *Microscopically*—the pyogram is completely identical with that of bacillary dysentery. Observations on many cases of *colitis ulcerosa* in Tashkent has led the author to conclude that this pathologic process is amicrobic.

Macrophages.—In all the three dysenteries of this paper, the pus contains plasmophages; these are the "macrophages" developing from the plasmocytes of Unna. These plasmophages are often mistaken for *Entamoeba dysenteriae* and many eminent protistologists have included these plasmophages in descriptions of the cycle of development of *E. dysenteriae*. The light chromatin masses in the periphery of the nucleus of supposed *E. dysenteriae* are really peripheral pyknosis in the nucleus of a plasmocyte!

The author's investigations reveal that ulceration of the intestinal mucous membrane leads always to formation of plasmophages. The presence of these plasmophages therefore can never constitute a diagnostic criterion. However, if they are numerous, it is a sign of favourable reaction, and resistance of the organism to the pathological process.

Mode of action of emetine.—Spasm of intestine occurs in amoebic (and in bacillary) dysentery. Emetine has a powerful paralysing action especially on the unstriped muscle of the gut; it would therefore counteract this spasm. The author has observed changes in the morphology of *E. histolytica* in the stools of cases of dysentery treated by subcutaneous injection of emetine. The amoebae become rounded with great retraction of endoplasm and almost complete immobility of ectoplasm—signs of direct poisoning action of the emetine.

Dobell & Laidlaw (1926), and Vogel (1927) are cited further in support of the view that emetine acts as a direct parasiticide, and not only as augmentor of the organism's natural means of defence.

Local eosinophilia in the intestine.—The author has often observed marked eosinophilia in the stools of cases of muco-membranous colitis. In amoebic dysentery he has noted often in the pus of stools collections of eosinophiles—accompanied usually by Charcot-Leyden crystals. In these cases the blood showed no eosinophilia. Frequently in the stools of these cases eosinophiles with a single nucleus (myelocytes) were found, though none could be found in the blood. This implies that the eosinophiles are found in the actual intestinal wall.

H. M. H.

Hance (J. B.). **The Sigmoidoscope as an Aid to Diagnosis in Chronic Dysentery and its Sequelae.**—*Indian Med. Gaz.* 1927. Sept. Vol. 62. No. 9. pp. 496–499. [8 refs.]

The author quotes Acton & Knowles (1924)—"The M.O. in charge of a mofussil dispensary may often have to diagnose 'dysentery' and to prescribe the stock 'dysentery mixture' of aperient sulphates. At least we have the knowledge that he is not thereby doing any harm; but we look forward to the day when a few relatively simple microscopical tests will enable him to give at least a more or less correct guess and to apply the correct treatment." Acton & Knowles have taken part in showing that bacillary is by far the commoner type of dysentery in India. Has not Dr. Mofussil therefore guessed most times correctly about the nature of his patient's dysentery and correctly prescribed the aperient sulphates, without hazarding a less or more incorrect view as to its nature through the microscope? In fact the differential diagnosis of dysentery by microscopical examination of stools is never simple at all, but requires no small training and skill.]

Major Hance urges that any factor which helps to establish diagnosis, especially if it be applicable where skilled laboratory assistance is not

available, is an aid to the practitioner and a benefit to the sufferer. Such a factor is the direct inspection of the mucosa of rectum and lower reaches of pelvic colon by the sigmoidoscope.

This instrument has long been used by proctologists, but its routine employment in diagnosis of chronic diarrhoea was first urged by HURST (1921). Later MANSON-BAHR and GREGG (1921) have advocated its use in amoebic dysentery; and RYLE (1924) has stressed its use in diagnosis and treatment of chronic diarrhoeas of colonic origin.

The author gives his own experience. The sigmoidoscope reveals—in *chronic amoebic dysentery*—pin-head ulcers, circular, saucer-shaped and distinct, with shallow craters, and bases clean or with yellow slough. The intervening mucous membrane is normal. Sometimes the ulcers crown small elevations, resembling minute boils or carbuncles. In more acute cases ulceration is more extensive and flame-shaped, and blood-stained mucus may obscure the view.

After successful emetine treatment, in mild cases the mucous membrane appears absolutely normal, in severer cases recent scarring is shown.

In chronic bacillary dysentery generally injected mucous membrane, strawberry-red, bleeding easily, or irregular ulcers, shallow, margins not undermined, bases with shreds of muco-pus, of which a film may cover whole ulcer: or exuberant granulation tissue masking adjacent ulceration. The intervening mucous membrane is swollen, turgid, strawberry-red and bleeds easily.

In favourable cases effect of treatment is theatrical, re-examination a few days after serum treatment revealing a mucous membrane which may be completely normal in appearance.

Diagnosis may be confidently made and treatment commenced on sigmoidoscopic appearances alone—*notwithstanding a negative or non-committal report from the laboratory.* Cases with positive laboratory report after appropriate treatment are not discharged until sigmoidoscope confirms laboratory negative report. RYLE (1926) has recorded cases similar to the author's where this instrument has established diagnosis and determined cure when laboratory reports had been persistently negative.

H. M. H.

FADERIN (K.). **Gaol Dysentery.**—*West African Med. Jl.* Lagos. 1927. Oct. Vol. 1. No. 2. pp. 24 & 28.

An outbreak of dysentery in a Nigerian prison lasting from mid-June to nearly the end of August, 1927. Sanitation, water supply, ventilation, space—on critical examination none of these could be adjudged as a contributory or causative factor. Owing to failure of yam supplies, the white imported rice was substituted for a body of prisoners whose accustomed diet was yam. The immediate effect of the rice diet was looseness of bowels followed by dysentery, which spread to prisoners whose diet had not been changed. Sixty-seven cases of dysentery were admitted to the Prison Infirmary and seven deaths occurred. Examination of faeces in two cases revealed Shiga bacillus; judging from cases treated in the African Hospital, amoebic was the type of dysentery most common in the town.

H. M. H.

SKELTON (D. S.), MALCOLM (J. W.) & LLOYD (R.). **"Dysentery" in Northern Iraq.**—*Jl. Roy. Army Med. Corps.* 1927. Aug. Vol. 49. No. 2. pp. 127–129. [3 refs.]

The authors declare that though it is of vital importance to arrive at a correct diagnosis of any dysentery, yet it is by no means always easy to do so. Their own work in Mosul confirms this. The so-called "Mosul-tummy" is one of the commonest of ailments among British troops in Mosul.

October 1925 to December 1926. 187 Cases Investigated.

Bacillary dysentery	29 cases.
Vegetative amoebae	1 ,,
E. histolytica cysts	32 ,,
Ova of intestinal parasites	16 ,,
B. typhosus isolated	1 ,,
Tubercle bacillus	1 ,,
Negative results	107 ,,

Of the 29 Bacillary Cases.

Gaertner group	14 cases.
Flexner	8 ,,
Morgan	1 ,,
Shiga	1 ,,
Unclassified	5 ,,

The 107 "negative results" cases is disappointing, but in accordance with the experience of other laboratory workers. Some of the cases were far from the hospital and there was not always due recognition of the necessity of sending specimens to the laboratory without delay. It is not surprising that all laboratory results in Iraq are not in agreement. Iraq is a big country with widely varying climatic and other conditions. The only common factors are dirt and dust and flies. The authors conclude that "bacillary" is the commonest form of dysentery and the commonest bacillus a Gaertner one. This predicates dirt in the kitchen and dirt on the hands of the cook and his mates. Even with efficient fly-proofing, until the mess sergeant forcibly washes the hands of the cook with some strong antiseptic several times a day, so long will there be diarrhoea and mild dysentery.

H. M. H.

HILL (Claire McDowell) & HILL (Rolla B.). **Infection with Protozoa and the Incidence of Diarrhoea and Dysentery in Porto Rican Children of the Pre-School Age.**—*Amer. Jl. Hyg.* 1927. Mar. Vol. 7. No. 2. pp. 134–146. [6 refs.]

(1) Smear and culture examinations of 300 faecal specimens from 125 Porto Rican children showed the following percentages of children infected.

Entamoeba coli, 19·2 per cent.
E. histolytica, 2·4 per cent.
Endolimax nana, 10·4 per cent.
Iodamoeba bütschii, 4·8 per cent.
Giardia lamblia, 47·2 per cent.
Chilomastix mesnili, 24 per cent.
Trichomonas hominis, 20·9 per cent.

(2) Compared with that found in Porto Rican adults the children's stools were lightly infected with amoebic cysts and heavily with flagéllates.

(3) Of the 125 children, 52·8 per cent. had suffered from recurrent or chronic diarrhoea for months or years, 25·6 from severe diarrhoea (not chronic or recurrent), 5·6 from one or more dysentery attacks and 16·8 had never had either dysentery or diarrhoea.

(4) Only 3 of the 125 were found to be carriers of *E. histolytica.* This parasite does not appear to be an important cause of diarrhoea or dysentery in Porto Rican children.

(5) Diarrhoea was much more common in those children who had flagellate infections than in those who had none. This relation was distinct, though it is not certain that the flagellates caused the diarrhoea.

H. M. H.

BRUCHMANN (Carlos A.) & STÁBILE DE NUCCI (Luis). Enterocolitis disenteriformes graves de la infancia observadas en la ciudad de Santiago del Estero. [**Severe Dysenteriform Enterocolitis in Childhood.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 232–241. [1 ref.] [Also issued as *3a Reunión Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 124–133.]

The symptoms of a grave intestinal disease of children in Santiago del Estero are related. These are: severe and in some cases uncontrollable diarrhoea, the stools being fluid, yellow, greenish or grey and mucoid, blood-tinged and even occasionally frankly haemorrhagic and accompanied by grave toxic symptoms and constitutional disturbance. No single cause is found; in some Shiga's bacillus is isolated, in others a special Streptococcus or a coliform organism; in short, nothing definite is known as to the aetiology. Six cases are mentioned, varying in age from 13 to 30 months. Four of these ended fatally, the stools in one of them numbering 70 in the 24 hours. Treatment is purely symptomatic, and is clearly not very successful.

H. Harold Scott.

RAYMOND-HAMET. Sur une drogue antidysentérique encore inconnue en France. [**An Antidysenteric Drug unknown in France.**]—*Bull. Acad. Méd.* 1927. July 19. Year 91. 3rd Ser. Vol. 98. No. 29. pp. 109–114. With 2 text figs. [23 refs.] [Pharm. Lab. Faculty of Med., Paris.]

Uzara, the root of an Asclepiad of the genus *Gomphocarpus* used by certain African tribes in diarrhoea and dysentery, was introduced into Europe in 1910 by HOPF. In 1917 HENNIG isolated its active principle —*uzarine.*

Panzaron, an alcoholic extract of uzara, contains more than 10 per cent. of uzarine. Panzaron has been used in various bowel complaints and its effects studied by different workers whose reports, though somewhat conflicting, are generally favourable to its use in dysentery. The author has shown (1926) that uzarine and panzaron do not act like adrenalin, for their vasoconstrictor and hypertensive action was not reversed by yohimbine nor by ergotamine. Later, with Jeanne LEVY, he showed that panzaron and uzarine arrest contractions in the isolated intestine, but increase intestinal tonus, while andrenalin diminishes it. In this paper the author describes his experiments, demonstrating that panzaron and uzarine arrest completely contractions of the intestine *in situ,* which is immobilized in a state of relaxation in contrast to the contracted state brought about by these drugs in the isolated gut. It is probable that panzaron acts on the local nervous system of the gut. The guineapig tolerates intraperitoneal injections of 250 mgm. of panzaron per kilogram of animal.

H. M. H.

LUCHINI (Federico P.) & PEREZ DE NUCCI (Roberto). Sobre un caso de perisigmoiditis con lamblias intestinales y su tratamiento por el yatrén 105. [**A Case of Lambliasis treated with Yatren 105.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 242–244. [Also issued as *3a Reunión, Soc. Argentina Patol. Regional del Norte, Tucumán, 7, 8 y 10, 1927.* pp. 134–136.]

A woman, 29 years of age, with a history of abdominal pain, more acute in the left iliac fossa, attacks of vomiting, copious diarrhoea, 20–30 stools a day, at intervals during 3 years. Nutrition was, nevertheless, well maintained. Examination of the stools revealed only Giardia. Treatment with Yatren, 4 pills, each of 25 cgm., thrice daily for ten days, followed by enemata, 200 cc. of a 3 per cent. solution, daily during the succeeding ten days, brought about a cure.

H. Harold Scott.

BRUG (S. L.). Note sur deux cas d'infection balantidienne traités à la santonine. [**Two Cases of Balantidial Infection treated with Santonin.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 741–743. [5 refs.] [Med. Lab., Weltevreden, Java.]

The author notes that of many drugs used in treating balantidiasis, stovarsol appears to have been the most successful; he now calls attention to two cases successfully treated with santonin.

Case I (1926) slight diarrhoea. Stool examination revealed *Balantidium coli*, and very numerous ascaris ova. The patient was given oil of chenopodium. This failed to expel all the ascaris and, though balantidium disappeared for 7 days, they were found again after a saline purge. The patient was then given during four days, 25 mgm. of santonin and 50 mgm. of calomel twice daily. In the following month stool examinations on 25 occasions revealed no balantidium even after saline purge.

Case II. The author quotes the case described by ONGKIEHONG (1927): a boy 8 years old suffered from dysentery; the bloody mucous stools containing *Balantidium coli*. During three days he was given 15 mgm. santonin and 30 mgm. of calomel thrice daily. Dysentery symptoms rapidly disappeared and for 19 days after the treatment a daily examination of the stool revealed no balantidium even after saline purge.

The author states that although two recorded successes is insufficient for a judgment on the real efficacy of santonin in balantidiasis, yet it warrants a further trial on a larger number of cases [?without calomel].

H. M. H.

FOX (Frank W.). **Balantidium Dysentery in an Infant.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Aug. 31. Vol. 21. No. 2. p. 153. [Baptist Mission Soc. Hosp., Sao Salvador do Congo, Angola.]

An infant 40 days old was found to be suffering from painful defaecation and diarrhoea of six hours' duration. The faeces contained blood and mucus, and by microscope revealed *Balantidium coli*. Magnesium sulphate, 1 drachm, was given on 3 consecutive days. No other treatment. Twenty-four hours after first dose blood and mucus disappeared and subsequent repeated microscopical examinations revealed no balantidia.

H. M. H.

SANMARTINO (Rodolfo). La disentería causada por el *Balantidium coli.* [**Balantidial Dysentery.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 195–222. With 23 figs. [38 refs.] [Also issued as *3a Reunión, Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 87–114.]

This paper gives a very clear account of balantidial infection, not only in man but in other primates and in the pig. It is of the nature of a summary or, rather, a detailed précis of our knowledge at the present day, but brings forward no new facts.

The larger and best part of the article is that describing the morbid anatomy, which is illustrated by good microphotographs.

H. Harold Scott.

BONNEL (F.). Sur un cas de balantidiase. [**A Case of Balantidiasis.**]—*Rev. Path. Comp. et Hyg. Gén.* 1927. June 20. Vol. 27. No. 327. pp. 692–696. [11 refs.]

The subject of this case was a young Algerian sepoy sent finally to Bordeaux after suffering from diarrhoea for about six months in the course of which he had become much emaciated. The stools contained *Balantidium coli,* but neither blood nor mucus. Neither thymol nor stovarsol have done lasting good, and the author therefore proposes to try treparsol.

A. Alcock.

HAREFUAH. 1927. July. Vol. 2. No. 3. pp. 413–418. With 2 charts.—A Review of Dysentery in Palestine. [KLIGLER (I.) & WEIZMANN (I.).]

——. pp. 418–424.—The War Against Amoebic Dysentery. [WINSHAL (Z.).]

——. pp. 424–433.—The Clinical Picture of Amoebic Dysentery. [LEVONTIN.]

——. pp. 433–438.—Treatment of Dysentery with Stovarsol. [STEIN (Joseph).]

——. pp. 438–441.—Specific and Non-Specific Therapy of Amoeb. Dysentery. [BICHOWSKY (A.).]

——. pp. 441–445.—Emetin, Yatren and Stovarsol in Amoebic Dysentery. [DEUTSCH. D. D.).]

MACIEL (Heraldo). Conceito actual da etiologia e do tratamento das dysenterias. *Sciencia Med.* 1927. May & Oct. Vol. 5. Nos. 5 & 10. pp. 235–250; 589–599.

REVIEWS AND NOTICES.

NOHL (Johannes) [Compiled by]. Translated by C. H. CLARKE [Ph.D.] **The Black Death. A Chronicle of the Plague.**—284 pp. With 12 plates & 28 text figs. First published in Great Britain in 1926. London: George Allen & Unwin, Ltd., Ruskin House, 40, Museum Street, W.C.1. [12s.]

This book is a compilation from various sources, German mainly; but including many works in other languages—Daniel DEFOE's history of the "Great Plague" in London, 1664 and 1665, is frequently quoted. The Bibliography at the end of the book fills several pages. The chief purpose of the work is to demonstrate the devastating inroads made in former times by epidemics into the spiritual and social life of the various nations. The purely medical aspect is not very much in evidence. The name "Black Death," commonly given to the plague of 1348, was the expression of the dread and horror aroused by the disease. Gloom went before and popular imagination depicted the plague as a man mounted on a black horse, or else as a black giant striding along, his head reaching above the roofs of the houses. People even feared to speak to any infected person. We are told that in 1347 Genoese sailors, infected with plague, entered the harbour of Messina: "In their bones they bore so virulent a disease that anyone who only spoke to them was seized by a mortal illness and in no manner could evade death."

Plague may or may not have originated in China as here stated; but the disease was known and feared all over the East long before the beginning of the Christian era. It dates from the earliest times when men gathered together in towns in the East and rats became a source of infection under unnatural and filthy surroundings. The disease obtained such evil eminence that it became known as *the pest* without qualification. It is believed that plague was little if at all known in Western Europe and England previous to the Crusades. Later, when extensive trade with India began in the sixteenth and seventeenth centuries *Mus decumanus* was a further source of infection. It is not possible to quote fully from all the various accounts of epidemics in Europe from the fourteenth to the eighteenth century; but one or two will be selected as general types of the records upon which this book is founded. A translation of BOCCACCIO's description of plague in Florence records that plague "by the just anger of God was sent upon us mortals," in 1348. It began "under the armpits, or in the groine by certain swellings, in some to the bignesse of an Apple, in others like an Egge, . . . which they termed to be a Botch or Byle." Of the virulence of the infection he says that the disease was at once contracted not only by speaking to the sick, but by touching their garments or food and not only by man, but by "any beast . . . were it Dogge, Cat, or any other." He records that he saw two swine tumbling infected clothes in the street "and immediately, each turning twice or thrice about, they both fell down dead." On the outbreak of an epidemic the rich fled from the towns and panic seized those that remained. Terror caused the patients to be forsaken even by their nearest relations. In a report on plague in Austria, 1679, we find the following: "Then there was no love, no faithfulness, no trust. No neighbour would lend a helping hand to another." The medical profession was helpless as regards any means of prevention or cure. There were many brave doctors and priests who visited the sick, but there are also records of cowardice in both professions. All business stopped and many died of famine. The plague epidemics found graphic expression in pictures of the "dance of Death." Such a picture was possessed by practically every large town as shown by several illustrations in this book.

Since nothing was known concerning the causation of plague until the nineteenth century it was generally thought to be sent as punishment for sin. The Churches, Catholic and Protestant, supported this view, and, if ignorance is sin, they were right. Even in the fourteenth century there were attempts to check the spread of the disease. Plague-infected cities,

such as Florence and Bristol, were cut off from neighbouring areas in 1348. In 1374, at Reggio, Visconte Bernabo ordered that: "Everyone sick of the plague is to be brought out of the town to the fields, there to die or recover." Plague regulations issued in Rouen in 1507 contain nothing of sanitary value, but announced "that everything is to be eliminated that could cause the anger of God, such as gambling, cursing, drinking, and all excesses." Orders were frequently given to destroy dogs and cats, but rats did not receive the same attention. The mortality throughout the centuries dealt with was appalling. The compiler gives a list of "celebrated men" who died of plague between 1138 and 1639 and states that the proportion of victims of plague in the fourteenth century in Europe is estimated to be too low if placed at 25 per cent. of the population. In 1467 Moscow mourned the loss of 127,000 victims, Novgorod and district of 230,602. In Rome 70,000 died in 1591. Thurgau lost more than half its population in 1611; the Republic of Venice 500,000 in 1630 and 1631 and London 160,000 in 1665 and so on. From a letter written from Naples, July 10th, 1656, by John Baptista Spinell, we learn that 60,000 corpses were burned and a further 170,000 buried in huge trenches. Owing to the terror created by the plague, the dead often lay in heaps in the streets and it was very difficult to get anyone to bury them. In some towns prisoners, driven by soldiers, were forced to act as gravediggers. These epidemics produced not only bodily death, but panic and extreme mental and moral deterioration. Men, women and children, in imitation of their elders, lost all control, all self-respect.

The rest of the book is filled up with chapters on various superstitions, the attitude of the Church, the diabolic element in plague, persecution of the Jews, the history of the Flagellants and Choreomania, which included dancing naked in the streets with added immorality. These chapters are not pleasant reading, except perhaps for the curious in Freudian psychology. Even the art of those times was affected and many of the illustrations are either grotesque or disgusting.

J. H. Tull Walsh.

WILSON (F. P.) **The Plague in Shakespeare's London.**—pp. xi + 228. With 27 illustrations. 1927. Oxford: At the Clarendon Press. [12s. 6d.]

The mention of plague in England recalls to the minds of most of us a passably clear recollection of the London Plague of 1665, thanks to Pepys and Defoe, together with a faint notion of an earlier Black Death at some rather uncertain epoch in the Middle Ages, all the long series of annectent epidemics being totally forgotten, perhaps never heard of. This book, which deals with the plague years of 1603 and 1625 and the intervening quiescent period, began originally as a commentary on Dekker's plague pamphlets, but with the growth of the author's materials the commentary has expanded into a volume of respectable dimensions wherein is traced the history of the Plague Orders and the Bills of Mortality from their inception, embellished with a wealth of detail and apt literary allusion which tells of many a weary hour of painstaking research. In his chapters describing the plague years the author paints a vivid picture of those awful times, when the cheerful sounds of a great city were replaced by the howling of starving dogs, the raving of the sick, and the mourning of the bereaved. Grass grew in the streets of London; commerce was at an end; in Cheapside a piece of gold could hardly be changed; spices for "comfortable Broth" were unobtainable, for the dealers had fled; and the only trades that flourished were those dependent on pestilence and death. Some of the entries quoted from the burial registers are truly pathetic—"A poor boy that died under St. John's wall," "a poor wench died in the Cage," "a poor child found at Mistress Bake's door." John, the son of Richard Sperwigg, was buried in Kensington on October 1st, his sister Mary, on the 26th, his

brother Richard four days later, his mother Alice on November 2nd, his brother Thomas on the 7th, and lastly Richard Sperwigg himself on the 23rd.

The author, as a layman, does not attempt to interpret in the light of modern epidemiological knowledge the pertinent observations of the age, sometimes very shrewd, but confines himself to the literary and historical aspects of his subject, except for an occasional venture into the medical domain—not always happy in the result, as when he states that the absence of external lesions in plague is indicative of the pneumonic variety of the disease.

A volume crammed with historical lore and fully documented might be permitted some measure of dulness; but here the materials have been handled so skilfully and enlivened by so delightful an infusion of English scholarship that the reader who once opens the book will find difficulty in closing it again. The author is to be congratulated on a very notable performance.

W. P. MacArthur.

Arbeiten ueber Tropenkrankheiten und deren Grenzgebiete. [**Works on Tropical Diseases.**] Bernhard NOCHT zu seinem 70. Geburtstag von Freunden und Schülern gewidmet.—*Abhandl. a. d. Gebiet d. Auslandsk.* (Herausg. v. Hamburg. Univ.) Vol. 26. (Ser. D. Vol. 2.). pp. x+643. With text figs. & 41 plates. 1927. Hamburg: Kommissionsverlag L. Friederichsen & Co.

The presentation to a professor on his birthday of a volume of original work by his pupils and friends is a pleasant custom and a graceful compliment: indeed it is more than that, for it is prompted by esteem and affection for the man, as well as by respect for the eminence of the teacher.

In this publication of the University of Hamburg, more than a hundred contributors, of many nationalities and including some of the best known authorities on tropical diseases, have joined forces to do honour to Professor Bernhard NOCHT on the occasion of his seventieth birthday.

Most of the articles are necessarily short, but the field surveyed is a wide one and cosmopolitan in range. Malaria naturally claims a large proportion of the book; medical zoology and therapeutics are also well represented. Among so much good mattter, it is difficult to choose any particular essay for special praise. The short article by Professor MOLDOVAN, on the Nature of Anaphylaxis, and that by Professor SCHUEFFNER and others, on the Aetiology of Yellow Fever and the significance of *Leptospira icteroides* Noguchi, are models of compression, such as is possible only to those how are real masters of their subjects. The contribution by Professor SEYFARTH, on Hodgkin's disease, is of much value to all who are interested in the diseases of the Tropics. But these are selections made almost at random, and there are many other articles of equal merit to those mentioned.

It must surely be a source of legitimate pride and great satisfaction to Professor NOCHT that he has been the inspiration of so much good work by his friends.

The book is well illustrated and well printed on good paper; the price is not stated.

H. J. Walton.